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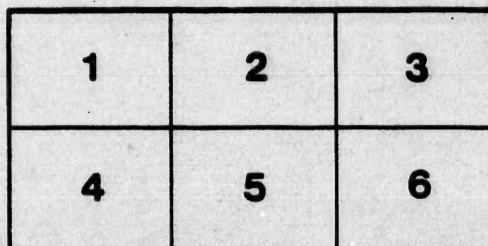
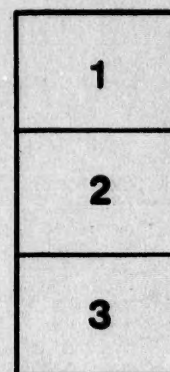
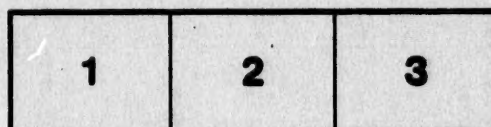
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REPORT

FROM

THE SECRETARY OF WAR,

*Communicating, in compliance with a resolution of the Senate, a copy of
Lieut. Fremont's report of his Exploring Expedition to the Rocky
Mountains.*

MARCH 2, 1843.

Read, and ordered to be printed.

MARCH 3, 1843.

Ordered, That nine hundred additional copies be furnished for the use of the Senate, and one hundred copies for the use of the Topographical Bureau.

WAR DEPARTMENT, March 2, 1843.

SIR: In answer to the resolution of the Senate of the United States of the 21st December last, requiring "the Secretary of War to send to the Senate a copy of Lieut. Fremont's report of his recent exploring expedition to the Rocky Mountains, made under the direction of the War Department," I respectfully transmit herewith the report just received from the Colonel of the Corps of Topographical Engineers.

Very respectfully, your obedient servant,
J. C. SPENCER.

HON. W. P. MANGUM,
President of the Senate.

BUREAU OF TOPOGRAPHICAL ENGINEERS,

WASHINGTON, March 2, 1843.

SIR: I have the honor to transmit the report and map of an exploring expedition to the Rocky Mountains, made during the last summer, under the orders of the Department, by Lieut. J. C. Fremont, of the Corps of Topographical Engineers, and which was called for by a resolution of the Senate of the 21st of last December.

Although so much time has elapsed since the calling for the report, allow me to say that it was not owing to any want of industry on the part of Lieut. Fremont, but to the great amount of matter which had to be introduced in the report, and the many calculations which had to be made of the astronomical and barometrical observations. The necessary labor on these accounts has delayed the completion of the report until to-day.

Very respectfully, sir, your obedient servant,
J. J. ABERT,

Colonel Corps of Topographical Engineers.

HON. J. C. SPENCER,
Secretary of War.

1998



CENTRAL CHAIN OF THE WIND RIVER MOUNTAINS

THE M

A REPORT

ON

AN EXPLORATION OF THE COUNTRY

LYING BETWEEN

THE MISSOURI RIVER AND THE ROCKY MOUNTAINS,

ON THE LINE OF

THE KANSAS AND GREAT PLATTE RIVERS.

BY **LIEUT. J. C. FREMONT,**

OF THE CORPS OF TOPOGRAPHICAL ENGINEERS.

WASHINGTON:

PRINTED BY ORDER OF THE UNITED STATES' SENATE.

1843.

CONTENTS

I. NARRATIVE OF THE EXPEDITION.

II. CATALOGUE OF PLANTS.

III. ASTRONOMICAL OBSERVATIONS.

IV. METEOROLOGICAL OBSERVATIONS.

NOTE.—The *Illustrations* of the life of the expedition in the form of
the following report, and intended to be issued to the public in the form of a
book, are the work of the expedition. The *Illustrations* of the expedition are placed
in the hands of the public, and the expedition which is intended to be
issued.

THOMAS C. LEXINGTON

W. L. LEXINGTON, Boston, 1851.

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the following are
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REPORT.

WASHINGTON, March 1, 1843.

To Col. J. J. ABERT,

Chief of the Corps of Topographical Engineers:

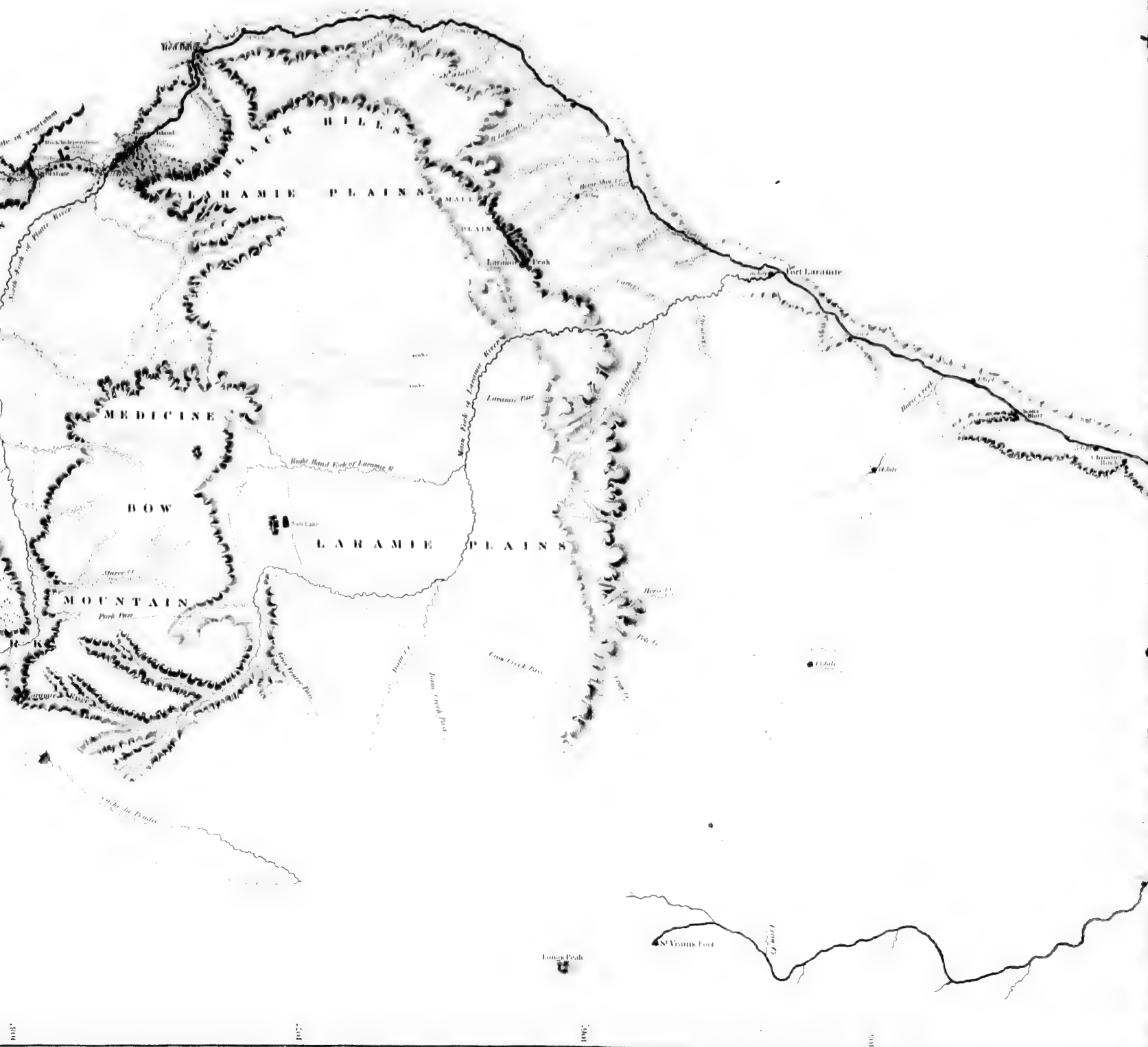
SIR: Agreeably to your orders to explore and report upon the country between the frontiers of Missouri and the South Pass in the Rocky mountains, and on the line of the Kansas and Great Platte rivers, I set out from Washington city on the 2d day of May, 1842, arrived at St. Louis, by way of New York, the 23d of May, where the necessary preparations were completed, and the expedition commenced. I proceeded in a steamboat to Chouteau's Landing, about 400 miles by water from St. Louis, and near the mouth of the Kansas river, whence we proceeded twelve miles to Mr. Cyprian Chouteau's trading house, where we completed our final arrangements for the expedition.

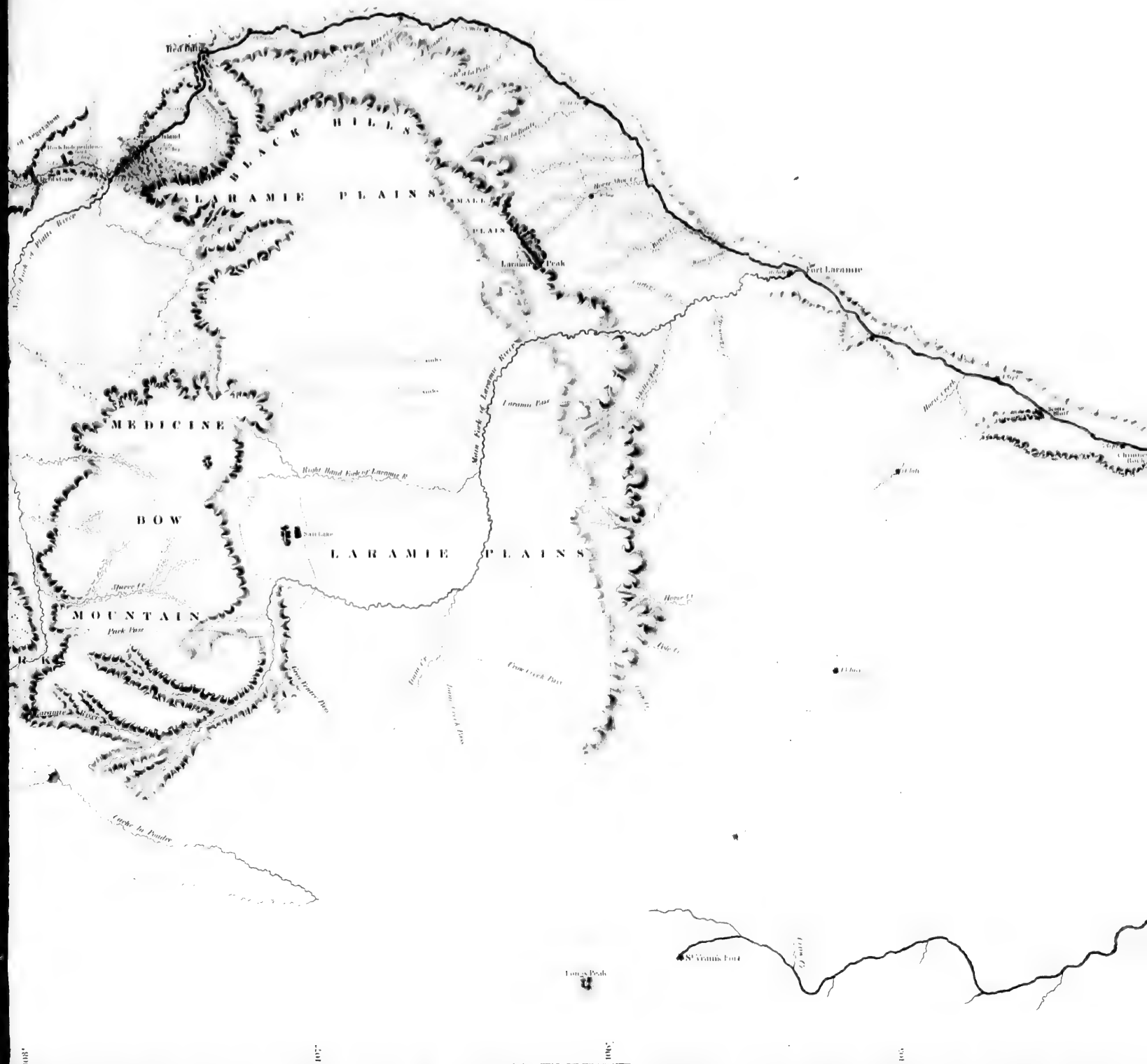
Bad weather, which interfered with astronomical observations, delayed us several days in the early part of June at this post, which is on the right bank of the Kansas river, about ten miles above the mouth and six beyond the western boundary of Missouri. The sky cleared off at length, and we were enabled to determine our position, in longitude $94^{\circ} 39' 16''$, and latitude $39^{\circ} 5' 57''$. The elevation above the sea is about 700 feet. Our camp, in the meantime, presented an animated and bustling scene. All were busily occupied in completing the necessary arrangements for our campaign in the wilderness, and profiting by this short delay on the verge of civilization, to provide ourselves with all the little essentials to comfort in the nomadic life we were to lead for the ensuing summer months. Gradually, however, everything, the *materiel* of the camp, men, horses, and even mules, settled into its place, and by the 10th we were ready to depart; but, before we mount our horses, I will give a short description of the party with which I performed this service.

I had collected in the neighborhood of St. Louis twenty-one men, principally Creole and Canadian *voyageurs*, who had become familiar with prairie life in the service of the fur companies in the Indian country. Mr. Charles Preuss, a native of Germany, was my assistant in the topographical part of the survey. L. Maxwell, of Kaskaskia, had been engaged as hunter, and Christopher Carson, more familiarly known for his exploits in the mountains as Kit Carson, was our guide. The persons engaged in St. Louis, were:

Clément Lambert, J. B. L'Esperance, J. B. Lefèvre, Benjamin Potra, Louis Gouin, J. B. Dumés, Basil Lajeunesse, François Tessier, Benjamin Cadotte, Joseph Clément, Daniel Simonds, Leonard Benoit, Michel Morly, Baptiste Bernier, Honoré Ayot, François Laulippé, François Badeau, Louis Ménard, Joseph Ruelle, Moïse Chardonnais, Auguste Janisse, Raphaël Proué.







M A P

TO ILLUSTRATE AN EXPLORATION OF THE COUNTRY,

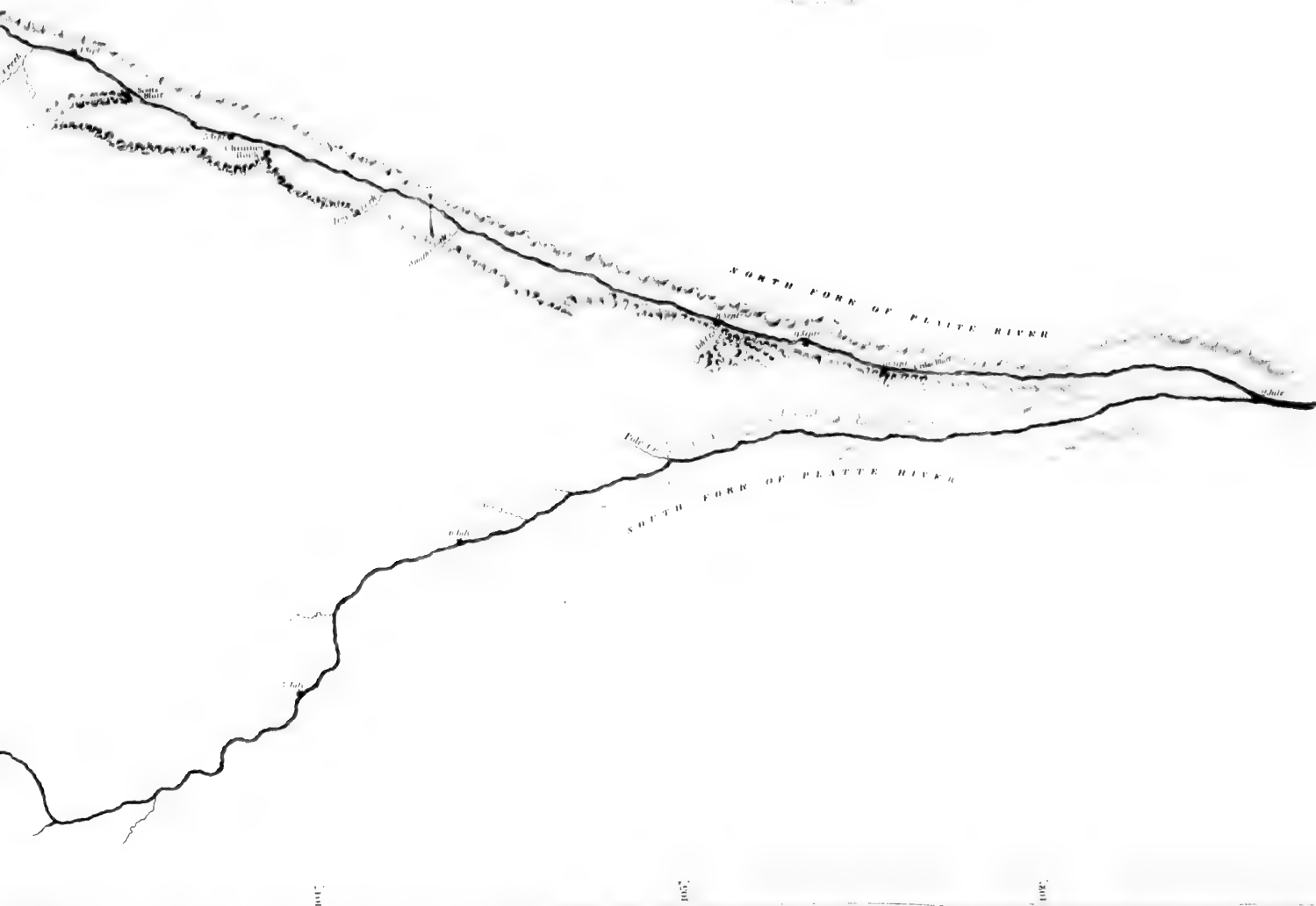
lying between the MISSOURI RIVER and the Rocky Mountains, on the line of the

NEBRASKA or PLATTE RIVER.

By Lieut J.C. FREMONT, OF THE CORPS OF TOPOGRAPHICAL ENGINEERS.

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The stars indicate astronomical positions.



In addition to these, Henry Brant, son of Col. J. B. Brant, of St. Louis, a young man of nineteen years of age, and Randolph, a lively boy of twelve, son of the Hon. Thomas H. Benton, accompanied me, for the development of mind and body which such an expedition would give. We were all well armed and mounted, with the exception of eight men, who conducted as many carts, in which were packed our stores, with the baggage and instruments, and which were each drawn by two mules. A few loose horses, and four oxen, which had been added to our stock of provisions, completed the train. We sat out on the morning of the 10th, which happened to be Friday, a circumstance which our men did not fail to remember and recall during the hardships and vexations of the ensuing journey. Mr. Cyprian Chouteau, to whose kindness during our stay at his house we were much indebted, accompanied us several miles on our way, until we met an Indian, whom he had engaged to conduct us on the first thirty or forty miles, where he was to consign us to the ocean of prairie, which, we were told, stretched without interruption, almost to the base of the Rocky Mountains.

From the belt of wood which borders the Kansas, in which we had passed several good looking Indian farms, we suddenly emerged on the prairies, which received us at the outset with some of their striking characteristics; for here and there rode an Indian, and but a few miles distant, heavy clouds of smoke were rolling before the fire. In about ten miles we reached the Santa Fé road, along which we continued for a short time, and encamped early, on a small stream, having travelled about eleven miles. During our journey, it was the customary practice to encamp an hour or two before sunset, when the carts were disposed so as to form a sort of barricade around a circle some eighty yards in diameter. The tents were pitched, and the horses hobbled and turned loose to graze; and but a few minutes elapsed before the cooks of the messes, of which there were four, were busily engaged in preparing the evening meal. At night fall, the horses, mules, and oxen, were driven in, and picketted—that is, secured by a halter, of which one end was tied to a small steel-shod picket, and driven into the ground; the halter being twenty or thirty feet long, which enabled them to obtain a little food during the night. When we had reached a part of the country where such a precaution became necessary, the carts being regularly arranged for defending the camp, guard was mounted at eight o'clock, consisting of three men, who were relieved every two hours; the morning watch being horse guard for the day. At daybreak the camp was roused, the animals turned loose to graze, and breakfast generally over between six and seven o'clock, when we resumed our march, making regularly a halt at noon for one or two hours. Such was usually the order of the day, except when accident of country forced a variation, which, however, happened but rarely. We travelled the next day along the Santa Fé road, which we left in the afternoon, and encamped late in the evening on a small creek, called by the Indians Mishmagwi. Just as we arrived at camp, one of the horses set off at full speed on his return, and was followed by others. Several men were sent in pursuit, and returned with the fugitives about midnight, with the exception of one man, who did not make his appearance until morning. He had lost his way in the darkness of the night, and slept on the prairie. Shortly after midnight, it began to rain heavily, and as our tents were of light and thin cloth, they offered but little obstruction to rain; we were all well soaked, and glad when morning came. We had a rainy march on the 12th,

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but the weather grew fine as the day advanced. We encamped in a remarkably beautiful situation on the Kansas Bluffs, which commanded a fine view of the river valley, here from three to four miles wide. The central portion was occupied by a broad belt of heavy timber, and nearer the hills the prairies were of the richest verdure. One of the oxen was killed here for food.

We reached the ford of the Kansas late in the afternoon of the 14th, where the river was two hundred and thirty yards wide, and commenced immediately preparations for crossing. I had expected to find the river fordable, but it had been swollen by the late rains, and was sweeping by with an angry current, yellow and turbid as the Missouri. Up to this point, the road we had travelled was a remarkably fine one, well beaten, and level, the usual road of a prairie country. By our route the ford was one hundred miles from the mouth of the Kansas river. Several mounted men led the way into the stream to swim across. The animals were driven in after them, and in a few minutes all had reached the opposite bank in safety, with the exception of the oxen, which swam some distance down the river, and returning to the right bank were not got over until the next morning. In the meantime, the carts had been unloaded and dismantled, and an India rubber boat, which I had brought with me for the survey of the Platte river, placed in the water. The boat was twenty feet long, and five broad, and on it was placed the body and wheels of a cart, with the load belonging to it, and three men with paddles.

The velocity of the current, and the inconvenient freight, rendering it difficult to be managed, Basil Lajeunesse, one of our best swimmers, took in his teeth a line attached to the boat, and swam ahead in order to reach a footing as soon as possible, and assist in drawing her over. In this manner, six passages had been successfully made, and as many carts with their contents, and a greater portion of the party deposited on the left bank, but night was drawing near, and in our anxiety to have all over before the darkness closed in, I put upon the boat the remaining two carts with their accompanying load. The man at the helm was timid in water, and in his alarm capsized the boat. Carts, barrels, boxes, and bales, were in a moment floating down the current, but all the men who were on the shore jumped into the water, without stopping to think if they could swim, and almost every thing, even heavy articles, such as guns and lead, were recovered.

Two of the men who could not swim came nigh being drowned, and all the sugar belonging to one of the messes wasted its sweets on the muddy waters; but our heaviest loss was a bag of coffee, which contained nearly all our provision. It was a loss which none but a traveller in a strange and inhospitable country can appreciate; and often afterward, when excessive toil and long marching had overcome us with fatigue and weariness, we remembered and mourned over our loss in the Kansas. Carson and Maxwell had been much in the water yesterday, and both in consequence were taken ill. The former continuing so, I remained in camp. A number of Kansas Indians visited us to-day. Going up to one of the groups who were scattered among the trees, I found one sitting on the ground among some of the men, gravely and fluently speaking French, with as much facility and as little embarrassment as any of my own party, who were nearly all of French origin.

On all sides was heard the strange language of his own people, wild, and harmonizing well with their appearance. I listened to him for some time with feelings of strange curiosity and interest. He was now apparently

thirty-five years of age; and, on inquiry, I learned that he had been at St. Louis when a boy, and there had learned the French language. From one of the Indian women I obtained a fine cow and calf in exchange for a yoke of oxen. Several of them brought us vegetables, pumpkins, onions, beans, and lettuce. One of them brought butter, and from a half-breed near the river I had the good fortune to obtain some twenty or thirty pounds of coffee. The dense timber in which we had encamped interfered with astronomical observations, and our wet and damaged stores required exposure to the sun. Accordingly the tents were struck early the next morning, and, leaving camp at six o'clock, we moved about seven miles up the river to a handsome, open prairie some twenty feet above the water, where the fine grass afforded a luxurious repast to our horses.

During the day we occupied ourselves in making astronomical observations, in order to lay down the country to this place, it being our custom to keep up our map regularly in the field, which we found attended with many advantages. The men were kept busy in drying the provisions, painting the cart covers, and otherwise completing our equipage, until the afternoon, when powder was distributed to them, and they spent some hours in firing at a mark. We were now fairly in the Indian country, and it began to be time to prepare for the chances of the wilderness.

Friday, June 17.—The weather yesterday had not permitted us to make the observations I was desirous to obtain here, and I therefore did not move to-day. The people continued their target firing. In the steep bank of the river here were nests of innumerable swallows, into one of which a large prairie snake had got about half his body, and was occupied in eating the young birds. The old ones were flying about in great distress, darting at him, and vainly endeavoring to drive him off. A shot wounded him, and, being killed, he was cut open, and eighteen young swallows were found in his body. A sudden storm that burst upon us in the afternoon cleared away in a brilliant sunset, followed by a clear night, which enabled us to determine our position in longitude $96^{\circ} 10' 06''$, and in latitude $39^{\circ} 06' 40''$.

A party of emigrants to the Columbia river, under the charge of Dr. White, an agent of the Government in Oregon Territory, were about three weeks in advance of us. They consisted of men, women, and children. There were sixty-four men and sixteen or seventeen families. They had a considerable number of cattle, and were transporting their household furniture in large heavy wagons. I understood that there had been much sickness among them, and that they had lost several children. One of the party who had lost his child, and whose wife was very ill, had left them about one hundred miles hence on the prairies; and as a hunter who had accompanied them visited our camp this evening, we availed ourselves of his return to the States to write to our friends.

The morning of the 18th was very unpleasant. A fine rain was falling, with cold wind from the north, and mists made the river hills look dark and gloomy. We left our camp at seven, journeying along the foot of the hills which border the Kansas valley, generally about three miles wide, and extremely rich. We halted for dinner, after a march of about thirteen miles, on the banks of one of the many little tributaries to the Kansas, which look like trenches in the prairie, and are usually well timbered. After crossing this stream, I rode off some miles to the left, attracted by the appearance of a cluster of huts near the mouth of the Vermillion. It was a large but deserted Kansas village, scattered in an open wood along the margin of the

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stream, on a spot chosen with the customary Indian fondness for beauty of scenery. The Pawnees had attacked it in the early spring. Some of the houses were burnt, and others blackened with smoke, and weeds were already getting possession of the cleared places. Riding up the Vermillion river, I reached the ford in time to meet the carts, and crossing, encamped on its western side. The weather continued cool, the thermometer being this evening as low as 49°, but the night was sufficiently clear for astronomical observations, which placed us in longitude 96° 36' 40" and latitude 39° 13' 19". At sunset the barometer was at 28.845, thermometer 64°.

We breakfasted the next morning at half past five, and left our encampment early. The morning was cool, the thermometer being at 45°. Quitting the river bottom, the road ran along the uplands over a rolling country, generally in view of the Kansas, from eight to twelve miles distant. Many large boulders of a very compact sandstone of various shades of red, some of them four or five tons in weight, were scattered along the hills; and many beautiful plants in flower, among which the *amorpha canescens* was a characteristic, enlivened the green of the prairie. At the heads of the ravines I remarked occasionally thickets of *saxifraga longifolia*, the most common willow of the country. We travelled nineteen miles, and pitched our tents at evening on the head waters of a small creek, now nearly dry, but having in its bed several fine springs. The barometer indicated a considerable rise in the country—here about fourteen hundred feet above the sea—and the increased elevation appeared already to have some slight influence upon the vegetation. The night was cold, with a heavy dew, the thermometer at ten standing at 46°, barometer 28.453. Our position was in longitude 96° 48' 05", and latitude 39° 30' 40".

The morning of the 20th was fine, with a southerly breeze and a bright sky, and at 7 o'clock we were on the march. The country to-day was rather more broken, rising still, and covered every where with fragments of siliceous limestone, particularly on the summits, where they were small, and thickly strewn as pebbles on the shore of the sea. In these exposed situations grew but few plants; though, whenever the soil was good and protected from the winds, in the creek bottoms and ravines, and on the slopes, they flourished abundantly; among them, the *amorpha* still retaining its characteristic place. We crossed, at 10, the Big Vermillion, which has a rich bottom of about one mile in breadth, one third of which is occupied by timber. Making our usual halt at noon, after a day's march of twenty-four miles, we reached the Big Blue, and encamped on the uplands of the western side, near a small creek, where was a fine large spring of very cold water. This is a clear and handsome stream, about one hundred and twenty feet wide, running with a rapid current through a well timbered valley. To-day, antelope were seen running over the hills, and at evening, Carson brought us a fine deer. Long. of the camp, 97° 06' 58", lat. 39° 45' 08". Thermometer, at sunset, 75°. A pleasant southerly breeze and fine morning had given place to a gale, with indications of bad weather, when, after a march of ten miles, we halted to noon on a small creek, where the water stood in deep pools. In the bank of the creek, limestone made its appearance in a stratum about one foot thick. In the afternoon, the people seemed to suffer for want of water. The road led along a high dry ridge; dark lines of timber indicated the heads of streams in the plains below, but there was no water near, and the day was very oppressive, with a hot wind, and the thermometer at 90°. Along our route, the *amorpha* has been in very abundant but variable

bloom: in some places, bending beneath the weight of purple clusters; in others, without a flower. It seems to love best the sunny slopes, with a dark soil and southern exposure. Every where the rose is met with, and reminds us of cultivated gardens and civilization. It is scattered over the prairies in small bosquets, and when glittering in the dews and waving in the pleasant breeze of the early morning, is the most beautiful of the prairie flowers. The *artemisia*, absinthe, or prairie sage, as it is variously called, is increasing in size, and glitters like silver, as the southern breeze turns up its leaves to the sun. All these plants have their insect inhabitants, variously colored; taking generally the hue of the flower on which they live. The *artemisia* has its small fly accompanying it through every change of elevation and latitude; and wherever I have seen the *asclepias tuberosa*, I have always remarked, too, on the flower, a large butterfly, so nearly resembling it in color, as to be distinguishable at a little distance only by the motion of its wings. Travelling on the fresh traces of the Oregon emigrants relieves a little the loneliness of the road; and to night, after a march of twenty-two miles, we halted on a small creek, which had been one of their encampments. As we advance westward, the soil appears to be getting more sandy, and the surface rock, an erratic deposit of sand and gravel, rests here on a bed of coarse yellow and gray and very friable sandstone. Evening closed over with rain and its usual attendant, hordes of mosquitoes, with which we were annoyed for the first time.

June 22.—We enjoyed at breakfast this morning a luxury very unusual in this country, in a cup of excellent coffee, with cream from our cow. Being milked at night, cream was thus had in the morning. Our mid-day halt was at Wyeth's creek, in the bed of which, were numerous boulders of dark ferruginous sandstone, mingled with others of the red sandstone already mentioned. Here a pack of cards, lying loose on the grass, marked an encampment of our Oregon emigrants; and it was at the close of the day when we made our bivouac in the midst of some well-timbered ravines near the Little Blue, twenty-four miles from our camp of the preceding night. Crossing the next morning a number of handsome creeks, with clear water and sandy beds, we reached, at 10, a very beautiful wooded stream, about thirty-five feet wide, called Sandy creek, and, sometimes, as the Otoes frequently winter there, the Otoe fork. The country has become very sandy, and the plants less varied and abundant, with the exception of the *amorpha*, which rivals the grass in quantity, though not so forward as it has been found to the eastward.

At the Big Trees, where we had intended to noon, no water was to be found. The bed of the little creek was perfectly dry, and on the adjacent sandy bottom *cacti*, for the first time, made their appearance. We made here a short delay in search of water, and, after a hard day's march of twenty-eight miles, encamped at five o'clock on the Little Blue, where our arrival made a scene of the Arabian desert. As fast as they arrived, men and horses rushed into the stream, where they bathed and drank together in common enjoyment. We were now in the range of the Pawnees, who were accustomed to infest this part of the country, stealing horses from companies on their way to the mountains, and when in sufficient force openly attacking and plundering them, and subjecting them to various kinds of insult. For the first time, therefore, guard was mounted to night. Our route the next morning lay up the valley, which, bordered by hills with graceful slopes, looked uncommonly green and beautiful. The stream was about fifty feet wide and three

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or four deep, fringed by cotton wood and willow, with frequent groves of oak tenanted by flocks of Turkeys. Game here, too, made its appearance in greater plenty. Elk were frequently seen on the hills, and now and then an antelope bounded across our path, or a deer broke from the groves. The road in the afternoon was over the upper prairies, several miles from the river, and we encamped at sunset on one of its small tributaries, where an abundance of *prêle* (*equisetum*) afforded fine forage to our tired animals. We had travelled thirty one miles. A heavy bank of black clouds in the west came on us in a storm between nine and ten, preceded by a violent wind. The rain fell in such torrents that it was difficult to breathe facing the wind, the thunder rolled incessantly, and the whole sky was tremulous with lightning; now and then illuminated by a blinding flash, succeeded by pitchy darkness. Carson had the watch from ten to midnight, and to him had been assigned our young *compagnons de voyage*, Messrs. Brant and R. Benton. This was their first night on guard, and such an introduction did not augur very auspiciously of the pleasures of the expedition. Many things conspired to render their situation uncomfortable; stories of desperate and bloody Indian fights were rife in the camp; our position was badly chosen, surrounded on all sides by timbered hollows, and occupying an area of several hundred feet, so that necessarily the guards were far apart; and now and then I could hear Randolph, as if relieved by the sound of a voice in the darkness, calling out to the sergeant of the guard, to direct his attention to some imaginary alarm; but they stood it out, and took their turn regularly afterward.

The next morning we had a specimen of the false alarms to which all parties in these wild regions are subject. Proceeding up the valley, objects were seen on the opposite hills, which disappeared before a glass could be brought to bear upon them. A man who was a short distance in the rear came spurring up in great haste, shouting Indians! Indians! He had been near enough to see and count them, according to his report, and had made out twenty-seven. I immediately halted, arms were examined and put in order; the usual preparations made; and Kit Carson, springing upon one of the hunting horses, crossed the river, and galloped off into the opposite prairies to obtain some certain intelligence of their movements.

Mounted on a fine horse, without a saddle, and scouring bareheaded over the prairies, Kit was one of the finest pictures of a horseman I have ever seen. A short time enabled him to discover that the Indian war party of twenty-seven consisted of six elk, who had been gazing curiously at our caravan as it passed by, and were now scampering off at full speed. This was our first alarm, and its excitement broke agreeably on the monotony of the day. At our noon halt, the men were exercised at a target, and in the evening we pitched our tents at a Pawnee encampment of last July. They had apparently killed buffalo here, as many bones were lying about, and the frames where the hides had been stretched were yet standing. The road of the day had kept the valley, which is sometimes rich and well timbered, though the country is generally sandy. Mingled with the usual plants, a thistle (*carduus leucographus*) had for the last day or two made its appearance; and along the river bottom, *tradesantia* (*virginica*) and milk plant (*asclepias syriaca*), in considerable quantities.

* "This plant is very odoriferous, and in Canada charms the traveller, especially when passing through woods in the evening. The French there eat the tender shoots in spring, as we do asparagus. The natives make a sugar of the flowers, gathering them in the morning

Our march to-day had been twenty-one miles, and the astronomical observations gave us a chronometric longitude of $98^{\circ} 54' 07''$, and latitude $40^{\circ} 26' 50''$. We were moving forward at seven in the morning, and in about five miles reached a fork of the Blue, where the road leaves that river, and crosses over to the Platte. No water was to be found on the dividing ridge, and the casks were filled and the animals here allowed a short repose. The road led across a high and level prairie ridge, where were but few plants, and those principally thistle (*carduus leucographus*), and a kind of dwarf artemisia. Antelope were seen frequently during the morning, which was very stormy. Squalls of rain, with thunder and lightning, were around us in every direction; and while we were enveloped in one of them, a flash, which seemed to scorch our eyes as it passed, struck in the prairie within a few hundred feet, sending up a column of dust.

Crossing on the way several Pawnee roads to the Arkansas, we reached, in about twenty-one miles from our halt on the Blue, what is called the coast of the Nebraska, or Platte river. This had seemed in the distance a range of high and broken hills, but on a nearer approach were found to be elevations of forty to sixty feet, into which the wind had worked the sand. They were covered with the usual fine grasses of the country, and bordered the eastern side of the ridge on a breadth of about two miles. Change of soil and country appeared here to have produced some change in the vegetation. Cacti were numerous, and all the plants of the region appeared to flourish among the warm hills. Among them the *amorpha*, in full bloom, was remarkable for its large and luxuriant purple clusters. From the foot of the coast, a distance of two miles across the level bottom brought us to our encampment on the shore of the river, about twenty miles below the head of Grand island, which lay extended before us, covered with dense and heavy woods. From the mouth of the Kansas, according to our reckoning, we had travelled three hundred and twenty-eight miles, and the geological formation of the country we had passed over, consisted of lime and sandstone, covered by the same erratic deposits of sand and gravel which forms the surface rock of the prairies between the Missouri and Mississippi rivers; except in some occasional limestone boulders, I had met with no fossils. The elevation of the Platte valley above the sea is here about two thousand feet. The astronomical observations of the night placed us in longitude $99^{\circ} 17' 47''$, latitude $40^{\circ} 41' 06''$.

June 27.—The animals were somewhat fatigued by their march of yesterday, and after a short journey of eighteen miles along the river bottom, I encamped near the head of Grand island, in longitude, by observation, $99^{\circ} 37' 45''$, latitude $40^{\circ} 39' 32''$. The soil here was light but rich, though in some places rather sandy; and, with the exception of a scattered fringe along the bank, the timber, consisting principally of poplar (*populus monilifera*), elm, and hackberry (*celtis crassifolia*), is confined almost entirely to the islands.

June 28.—We halted to noon at an open reach of the river, which occupies rather more than a fourth of the valley, here only about four miles broad.

when they are covered with dew, and collect the cotton from the pods to fill their beds. On account of the silkiness of this cotton, Parkinson calls the plant Virginian silk."—*Loudon's Encyclopedia of Plants*.

The Sioux Indians of the Upper Platte eat the young pods of this plant, boiling them with the meat of the buffalo.

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The camp had been disposed with the usual precaution, the horses grazing at a little distance attended by the guard, and we were all sitting quietly at our dinner on the grass, when suddenly we heard the startling cry, "*des mondes*!" In an instant, every man's weapon was in his hand, the horses were driven in, hobbled and picketted, and horsemen were galloping at full speed in the direction of the new comers, screaming and yelling with the wildest excitement. "Get ready, my lads!" said the leader of the approaching party to his men, when our wild-looking horsemen were discovered bearing down upon them; "*nous allons attraper des coups de baquette*." They proved to be a small party of fourteen, under the charge of a man named John Lee, and with their baggage and provisions strapped to their backs, were making their way on foot to the frontier. A brief account of their fortunes will give some idea of navigation in the Nebraska. Sixty days since they had left the mouth of Laramie's fork, some three hundred miles above, in barges laden with the furs of the American Fur Company. They started with the annual flood, and drawing but nine inches water, hoped to make a speedy and prosperous voyage to St. Louis; but, after a lapse of forty days, found themselves only one hundred and thirty miles from their point of departure. They came down rapidly as far as Scott's bluffs, where their difficulties began. Sometimes they came upon places where the water was spread over a great extent, and here they toiled from morning until night, endeavoring to drag their boat through the sands, making only two or three miles in as many days. Sometimes they would enter an arm of the river, where there appeared a fine channel, and after descending prosperously for eight or ten miles, would come suddenly upon dry sands, and be compelled to return, dragging their boat for days against the rapid current; and at others, they came upon places where the water lay in holes, and getting out to float off their boat, would fall into water up to their necks, and the next moment tumble over against a sandbar. Discouraged at length, and finding the Platte growing every day more shallow, they discharged the principal part of their cargoes one hundred and thirty miles below Fort Laramie, which they secured as well as possible, and leaving a few men to guard them, attempted to continue their voyage, laden with some light furs and their personal baggage. After fifteen or twenty days more struggling in the sands, during which they made but one hundred and forty miles, they sunk their barges made a *cache* of their remaining furs and property, in trees on the bank, and packing on his back what each man could carry, had commenced, the day before we encountered them, their journey on foot to St. Louis.

We laughed then at their forlorn and vagabond appearance, and in our turn a month or two afterward furnished the same occasion for merriment to others. Even their stock of tobacco, that *sine qua non* of a *voyageur*, without which the night fire is gloomy, was entirely exhausted. However, we shortened their homeward journey by a small supply from our own provision. They gave us the welcome intelligence that the Buffalo were abundant some two days march in advance, and made us a present of some choice pieces, which were a very acceptable change from our salt pork. In the interchange of news, and the renewal of old acquaintanceships, we found wherewithal to fill a busy hour, then we mounted our horses, and they shouldered their packs, and we shook hands and parted. Among them, I had found an old companion on the northern prairie, a hardened and hardly served veteran of the mountains, who had been as

much hacked and scarred as an old *moustache* of Napoleon's "old guard." He flourished in the soubriquet of La Tulipe, and his real name I never knew. Finding that he was going to the States only because his company was bound in that direction, and that he was rather more willing to return with me, I took him again into my service. We travelled this day but seventeen miles.

At our evening camp, about sunset, three figures were discovered approaching, which our glasses made out to be Indians. They proved to be Cheyennes, two men and a boy of thirteen. About a month since they had left their people on the south fork of the river, some three hundred miles to the westward, and a party of only four in number, had been to the Pawnee villages on a horse stealing excursion, from which they were returning unsuccessful. They were miserably mounted on wild horses from the Arkansas plains, and had no other weapons than bows and long spears; and had they been discovered by the Pawnees, could not, by any possibility, have escaped. They were mortified by their ill success, and said the Pawnees were cowards who shut up their horses in their lodges at night. I invited them to supper with me, and Randolph and the young Cheyenne, who had been eyeing each other suspiciously and curiously, soon became intimate friends. After supper we sat down on the grass, and I placed a sheet of paper between us, on which they traced rudely, but with a certain degree of relative truth, the water courses of the country which lay between us and their villages, and of which I desired to have some information. Their companions, they told us, had taken a nearer route over the hills, but they had mounted one of the summits to spy out the country, whence they had caught a glimpse of our party, and confident of good treatment at the hands of the whites, hastened to join company. Latitude of the camp $40^{\circ} 30' 51''$.

We made the next morning sixteen miles. I remarked that the ground was covered in many places with an efflorescence of salt, and the plants were not numerous. In the bottoms was frequently seen, *tridescantia*, and on the dry benches, were *carduus*, *cactus*, and *amorpha*. A high wind during the morning had increased to a violent gale from the northwest, which made our afternoon ride cold and unpleasant. We had the welcome sight of two buffalo on one of the large islands; and encamped at a clump of timber about seven miles from our noon halt, after a days march of twenty-two miles.

The air was keen the next morning at sunrise, the thermometer standing at 44° , and it was sufficiently cold to make overcoats very comfortable. A few miles brought us into the midst of the Buffalo, swarming in immense numbers over the plains, where they had left scarcely a blade of grass standing. Mr. Preuss, who was sketching at a little distance in the rear, had at first noted them as large groves of timber. In the sight of such a mass of life, the traveller feels a strange emotion of grandeur. We had heard from a distance a dull and confused murmuring, and when we came in view of their dark masses, there was not one among us who did not feel his heart beat quicker. It was the early part of the day, when the herds are feeding; and every where they were in motion. Here and there a huge old bull was rolling in the grass, and clouds of dust rose in the air from various parts of the bands, each the scene of some obstinate fight. Indians and buffalo make the poetry and life of the prairie, and our camp was full of their exhilaration. In place of the quiet monotony of the march, re-

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lived only by the cracking of the whip, and an "*avance done! enfant de gares!*" shouts and songs resounded from every part of the line, and our evening camp was always the commencement of a feast, which terminated only with our departure ~~on~~ the following morning. At any time of the night might be seen pieces of the most delicate and choicest meat, roasting *en appolas*, on sticks around the fire, and the guard were never without company. With pleasant weather and no enemy to fear, an abundance of the most excellent meat, and no scarcity of brand or tobacco, they were enjoying the oasis of a voyageur's life. Three cows were killed to-day. Kit Carson had shot one, and was continuing the chase in the midst of another herd, when his horse fell headlong, but sprang up and joined the flying band. Though considerably hurt, he had the good fortune to break no bones, and Maxwell, who was mounted on a fleet hunter, captured the runaway after a hard chase. He was on the point of shooting him to avoid the loss of his bridle, a handsomely mounted Spanish one, when he found that his horse was able to come up with him. Animals are frequently lost in this way, and it is necessary to keep close watch over them, in the vicinity of the buffalo, in the midst of which they scour off to the plains, and are rarely retaken. One of our mules took a sudden freak into his head and joined a neighboring band to-day. As we were not in a condition to lose horses, I sent several men in pursuit and remained in camp, in the hope of recovering him, but lost the afternoon to no purpose, as we did not see him again. Astronomical observations placed us in longitude $100^{\circ} 38' 10''$, latitude $40^{\circ} 49' 55''$.

July 1.—Along our road to-day the prairie bottom was more elevated and dry, and the hills which border the right side of the river higher and more broken and picturesque in the outline. The country too was better timbered. As we were riding quietly along the bank, a grand herd of buffalo, some seven or eight hundred in number, came crowding up from the river, where they had been to drink, and commenced crossing the plain slowly, eating as they went. The wind was favorable, the coolness of the morning invited to exercise, the ground was apparently good, and the distance across the prairie, two or three miles, gave us a fine opportunity to charge them before they could get among the river hills. It was too fine a prospect for a chase to be lost, and, halting for a few moments, the hunters were brought up and saddled, and Kit Carson, Maxwell, and I, started together. They were now somewhat less than half a mile distant, and we rode easily along until within about three hundred yards, when a sudden agitation, a wavering in the band, and a galloping to and fro of some which were scattered along the skirts, gave us the intimation that we were discovered. We started together at a hand gallop, riding steadily abreast of each other, and here the interest of the chase became so engrossingly intense, that we were sensible to nothing else. We were now closing upon them rapidly, and the front of the mass was already in rapid motion for the hills, and in a few seconds the movement had communicated itself to the whole herd.

A crowd of bulls, as usual, brought up the rear, and every now and then some of them faced about, and then dashed on after the band a short distance, and turned and looked again, as if more than half inclined to stand and fight. In a few moments, however, during which we had been quickening our pace, the rout was universal, and we were going over the ground like a hurricane. When at about thirty yards we gave the usual shout, the hunters *pas de charge*, and broke into the herd. We entered on the side,

the mass giving way in every direction in their heedless course. Many of the bulls, less active and less fleet than the cows, paying no attention to the ground, and occupied solely with the hunter, were precipitated to the earth with great force, rolling over and over with the violence of the shock, and hardly distinguishable in the dust. We separated on entering, each singling out his game.

My horse was a trained hunter, famous in the west, under the name of Proveau, and with his eyes flashing, and the foam flying from his mouth, sprang on after the cow like a tiger. In a few moments he brought me alongside of her, and rising in the stirrups, I fired at the distance of a yard, the ball entering at the termination of the long hair, and passing near the heart. She fell headlong at the report of the gun, and checking my horse, I looked around for my companions. At a little distance Kit was on the ground, engaged in tying his horse to the horns of a cow which he was preparing to cut up. Among the scattered bands at some distance below I caught a glimpse of Maxwell; and while I was looking, a light wreath of white smoke curled away from his gun, of which I was too far to hear the report. Nearer, and between me and the hills, towards which they were directing their course, was the body of the herd, and giving my horse the rein, we dashed after them. A thick cloud of dust hung upon their rear, which filled my mouth and eyes, and nearly smothered me. In the midst of this I could see nothing, and the buffalo were not distinguishable until within thirty feet. They crowded together more densely still as I came upon them, and rushed along in such a compact body that I could not obtain an entrance—the horse almost leaping upon them. In a few moments the mass divided to the right and left, the horns clattering with a noise heard above every thing else, and my horse darted into the opening. Five or six bulls charged on us as we dashed along the line, but were left far behind, and singling out a cow, I gave her my fire, but struck too high. She gave a tremendous leap, and scoured on swifter than before. I reined up my horse, and the band swept on like a torrent, and left the place quiet and clear. Our chase had led us into dangerous ground. A prairie-dog village so thickly settled that there were three or four holes in every twenty yards square, occupied the whole bottom for nearly two miles in length. Looking around, I saw only one of the hunters, nearly out of sight, and the long dark line of our caravan crawling along three or four miles distant. After a march of twenty-four miles, we encamped at nightfall, one mile and a half above the lower end of Brady's island. The breadth of this arm of the river was eight hundred and eighty yards, and the water nowhere two feet in depth. The island bears the name of a man killed on this spot some years ago. His party had encamped here, three in company, and one of the number went off to hunt, leaving Brady and his companion together. These two had frequently quarrelled, and on the hunter's return he found Brady dead, and was told that he had shot himself accidentally. He was buried here on the bank, but, as usual, the wolves had torn him out; and some human bones that were lying on the ground we supposed were his. Troops of wolves that were hanging on the skirts of the buffalo, kept up an uninterrupted howling during the night, venturing almost into camp. In the morning, they were sitting at a short distance, barking, and impatiently waiting our departure to fall upon the bones.

July 2.—The morning was cool and smoky. Our road led closer to the hills, which here increased in elevation, presenting an outline of conical

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peaks three hundred to five hundred feet high. Some timber, apparently pine, grew in the ravines, and streaks of clay or sand whiten their slopes. We crossed during the morning a number of hollows, timbered principally with box elder (*acer negundo*), poplar, and elm. Brady's island is well wooded, and all the river along which our road led to-day may, in general, be called tolerably well timbered. We passed near an encampment of the Oregon emigrants, where they appear to have reposed several days. A variety of household articles were scattered about, and they had probably disburdened themselves here of many things not absolutely necessary. I had left the usual road before the mid-day halt, and in the afternoon, having sent several men in advance to reconnoitre, marched directly for the mouth of the South fork. On our arrival, the horsemen were sent in and scattered about the river to search the best fording places, and the carts followed immediately. The stream is here divided by an island into two channels. The southern is four hundred and fifty feet wide, having eighteen or twenty inches water in the deepest places. With the exception of a few dry bars, the bed of the river is generally quicksands, in which the carts began to sink rapidly so soon as the mules halted, so that it was necessary to keep them constantly in motion.

The northern channel, 2,250 feet wide, was somewhat deeper, having frequently three feet water in the numerous small channels, with a bed of coarse gravel. The whole breadth of the Nebraska, immediately below the junction, is 5,350 feet. All our equipage had reached the left bank safely at six o'clock, having to-day made twenty miles. We encamped at the point of land immediately at the junction of the North and South forks. Between the streams is a low rich prairie, extending from their confluence 18 miles westwardly to the bordering hills, where it is $5\frac{1}{2}$ miles wide. It is covered with a luxuriant growth of grass, and along the banks is a slight and scattered fringe of cottonwood and willow. In the buffalo trails and wallows, I remarked saline efflorescences, to which a rapid evaporation in the great heat of the sun probably contributes, as the soil is entirely unprotected by timber. In the vicinity of these places, there was a bluish grass, which the cattle refuse to eat, called by the voyageurs "*herbe saleë*," (salt grass.) The latitude of the junction is $41^{\circ} 4' 47''$, and longitude by chronometer and lunar distances, $101^{\circ} 21' 24''$. The elevation above the sea is about 2,700 feet. The hunters came in with a fat cow, and, as we had labored hard, we enjoyed well a supper of roasted ribs and *boudins*, the *chef d'œuvre* of a prairie cook. Mosquitoes thronged about us this evening; but by 10 o'clock, when the thermometer had fallen to 47° , they had all disappeared.

July 3.—As this was to be a point in our homeward journey, I made a *cache* (a term used in all this country for what is hid in the ground) of a barrel of pork. It was impossible to conceal such a proceeding from the sharp eyes of our Cheyenne companions, and I therefore told them to go and see what it was they were burying. They would otherwise have not failed to return and destroy our *cache*, in expectation of some rich booty; but pork they dislike and never eat. We left our camp at 9, continuing up the South fork, the prairie bottom affording us a fair road; but in the long grass we roused myriads of mosquitoes and flies, from which our horses suffered severely. The day was smoky, with a pleasant breeze from the south, and the plains on the opposite side were covered with buffalo. Having travelled twenty-five miles we encamped at 6 in the evening, and the men were sent across the river for wood, as there is none here on the left bank. Our fires

were partially made of the *bois de vache*, the dry excrement of the buffalo, which like that of the camel in the Arabian deserts, furnishes to the traveller a very good substitute for wood, burning like turf. Wolves in great numbers surrounded us during the night, crossing and recrossing from the opposite herds to our camp, and howling and trotting about in the river until morning.

July 4.—The morning was very smoky, the sun shining dimly and red, as in a thick fog. The camp was roused with a salute at daybreak, and from our scanty store a portion of what our Indian friends called the "red fire-water" served out to the men. While we were at breakfast, a buffalo calf broke through the camp, followed by a couple of wolves. In its fright, it had probably mistaken us for a band of buffalo. The wolves were obliged to make a circuit around the camp, so that the calf got a little the start, and strained every nerve to reach a large herd at the foot of the hills, about two miles distant; but first one and then another and another wolf joined in the chase, until his pursuers amounted to twenty or thirty, and they ran him down before he could reach his friends. There were a few bulls near the place, and one of them attacked the wolves and tried to rescue him; but was driven off immediately, and the little animal fell an easy prey, half devoured before he was dead. We watched the chase with the interest always felt for the weak, and had there been a saddled horse at hand, he would have fared better. Leaving camp, our road soon approached the hills in which strata of a marl like that of the chimney rock, hereafter described, make their appearance. It is probably of this rock that the hills, on the right bank of the Platte, a little below the junction, are composed, and which are worked by the winds and rains into sharp peaks and cones, giving them, in contrast to the surrounding level region, something of a picturesque appearance. We crossed this morning numerous beds of the small creeks, which in the time of rains and melting snow, pour down from the ridge, bringing down with them always great quantities of sand and gravel, which have gradually raised their beds four to ten feet above the level of the prairie which they cross, making each one of them a miniature Po. Raised in this way above the surrounding prairie, without any bank, the long yellow and winding line of their beds resembles a causeway from the hills to the river. Many spots on the prairie are yellow with sunflower (*helianthus*.)

As we were riding slowly along this afternoon, clouds of dust in the ravines, among the hills to the right, suddenly attracted our attention, and in a few minutes column after column of buffalo came galloping down, making directly to the river. By the time the leading herds had reached the water, the prairie was darkened with the dense masses. Immediately before us, when the bands first came down into the valley, stretched an unbroken line, the head of which was lost among the river hills on the opposite side, and still they poured down from the ridge on our right. From hill to hill the prairie bottom was certainly not less than two miles wide, and allowing the animals to be ten feet apart, and only ten in a line, there were already 11,000 in view. Some idea may thus be formed of their number when they had occupied the whole plain. In a short time they surrounded us on every side, extending for several miles in the rear, and forward, as far as the eye could reach, leaving around us as we advanced, an open space of only two or three hundred yards. This movement of the buffalo indicated to us the presence of Indians on the North fork.

I halted earlier than usual, about forty miles from the junction, and all hands were soon busily engaged in preparing a feast to celebrate the day.

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The kindness of our friends at St. Louis had provided us with a large supply of excellent preserves and rich fruit cake; and when these were added to a macaroni soup and variously prepared dishes of the choicest buffalo meat, crowned with a cup of coffee, and enjoyed with prairie appetite, we felt, as we sat in barbaric luxury around our smoking supper on the grass, a greater sensation of enjoyment than the Roman epicure at his perfumed feast. But most of all it seemed to please our Indian friends, who in the unrestrained joyment of the moment, demanded to know if our "Medicine days came often." No restraint was exercised at the hospitable board, and, to the great delight of his elders, our young Indian lad made himself extremely drunk.

Our encampment was within a few miles of the place where the road crosses to the North fork, and various reasons led me to divide my party at this point. The North fork was the principal object of my survey, but I was desirous to ascend the South branch, with a view of obtaining some astronomical positions, and determining the mouths of its tributaries as far as St. Vrain's fort, estimated to be some two hundred miles further up the river, and near to Long's peak. There I hoped to obtain some mules, which I found would be necessary to relieve my horses. In a military point of view, I was desirous to form some opinion of the country relative to the establishment of posts on a line connecting the settlements with the South pass of the Rocky mountains, by way of the Arkansas, the South and Laramie forks of the Platte. Crossing the country northwestwardly from St. Vrain's fort, to the American company's fort at the mouth of Laramie, would give me some acquaintance with the affluents which head in the mountains between the two; I therefore determined to set out the next morning, accompanied by Mr. Preuss and four men, Maxwell, Bernier, Ayot, and Basil Lajeunesse. Our Cheyennes, whose village lay up this river, also decided to accompany us. The party I left in charge of Clément Lambert, with orders to cross to the North fork; and at some convenient place, near to the *Coulée des Frênes*, make a cache of every thing not absolutely necessary to the further progress of our expedition. From this point, using the most guarded precaution in his march through the country, he was to proceed to the American company's fort at the mouth of Laramie's fork, and await my arrival, which would be prior to the 16th, as on that and the following night would occur some occultations which I was desirous to obtain at that place.

July 5.—Before breakfast all was ready. We had one led horse in addition to those we rode, and a pack mule, destined to carry our instruments, provisions, and baggage; the last two articles not being of very great weight. The instruments consisted of a sextant, artificial horizon, &c., a barometer, spy-glass, and compass. The chronometer I of course kept on my person. I had ordered the cook to put up for us some flour, coffee, and sugar, and our rifles were to furnish the rest. One blanket, in addition to his saddle and saddle blanket, furnished the materials for each man's bed, and every one was provided with a change of linen. All were armed with rifles or double barrelled guns; and, in addition to these, Maxwell and myself were furnished with excellent pistols. Thus accoutred, we took a parting breakfast with our friends, and set forth.

Our journey the first day afforded nothing of any interest. We shot a buffalo toward sunset, and having obtained some meat for our evening meal, encamped where a little timber afforded us the means of making a fire. Having disposed our meat on roasting sticks, we proceeded to un-

pack our bales in search of coffee and sugar, and flour for bread. With the exception of a little parched coffee, unground, we found nothing. Our cook had neglected to put it up, or it had been somehow forgotten. Tired and hungry, with tough bull meat without salt, for we had not been able to kill a cow, and a little bitter coffee, we sat down in silence to our miserable fare, a very disconsolate party; for yesterday's feast was yet fresh in our memories, and this was our first brush with misfortune. Each man took his blanket, and laid himself down silently; for the worst part of these mishaps is, that they make people ill-humoured. To-day we had travelled about thirty-six miles.

July 6.—Finding that our present excursion would be attended with considerable hardship, and unwilling to expose more persons than necessary, I determined to send Mr. Preuss back to the party. His horse, too, appeared in no condition to support the journey, and accordingly, after breakfast, he took the road across the hills attended by one of my most trusty men, Bernier. The ridge between the river is here about fifteen miles broad, and I expected he would probably strike the fork near their evening camp. At all events he would not fail to find their trail and rejoin them the next day.

We continued our journey, seven in number, including the three Cheyennes. Our general course was southwest, up the valley of the river, which was sandy, bordered on the northern side of the valley by a low ridge, and on the south, after seven or eight miles, the river hills became higher. Six miles from our resting place we crossed the bed of a considerable stream, now entirely dry, a bed of sand. In a grove of willows near the mouth were the remains of a considerable fort, constructed of trunks of large trees. It was apparently very old, and had probably been the scene of some hostile encounter among the roving tribes. Its solitude formed an impressive contrast to the picture which our imaginations involuntarily drew of the busy scene which had been enacted here. The timber appeared to have been much more extensive formerly than now. There were but a few trees, a kind of long-leaved willow, standing; and numerous trunks of large trees were scattered about on the ground. In many similar places I had occasion to remark an apparent progressive decay in the timber. Ten miles further we reached the mouth of Lodge Pole creek, a clear and handsome stream, running through a broad valley. In its course through the bottom it has a uniform breadth of twenty-two feet, and six inches in depth. A few willows on the banks strike pleasantly on the eye, by their greenness, in the midst of the hot and barren sands.

The *amorpha* was frequent among the ravines; but the sunflower (*helianthus*) was the characteristic; and flowers of deep warm colors seem most to love the sandy soil. The impression of the country travelled over to-day, was one of dry and barren sands. We turned in towards the river at noon, and gave our horses two hours for food and rest. I had no other thermometer than the one attached to the barometer, which stood at 89° , the height of the column in the barometer being 26.235, at meridian. The sky was clear, with a high wind from the south. At 2, we continued our journey; the wind had moderated, and it became almost unendurably hot, and our animals suffered severely. In the course of the afternoon, the wind rose suddenly, and blew hard from the southwest, with thunder and lightning and squalls of rain; these were blown against us with violence by the wind, and halting, we turned our backs to the storm until it blew over. Antelope

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were tolerably frequent, with a large gray hare; but the former were shy, and the latter hardly worth the delay of stopping to shoot them; so, as evening drew near, we again had recourse to an old bull, and encamped at sunset on an island in the Platte.

We ate our meat with good relish this evening, for we were all in fine health, and had ridden nearly all of a long summer's day, with a burning sun reflected from the sands. My companions slept, rolled up in their blankets, and the Indians lay in the grass near the fire, but my sleeping place generally had an air of more pretension. Our rifles were tied together near the muzzle, the butts resting on the ground, and a knife laid on the rope to cut away in case of an alarm. Over this, which made a kind of frame, was thrown a large India-rubber cloth, which we used to cover our packs. This made a tent sufficiently large to receive about half of my bed, and was a place of shelter for my instruments; and as I was careful always to put this part against the wind, I could lie here with a sensation of satisfied enjoyment, and hear the wind blow and the rain patter close to my head, and know that I should be at least half dry. Certainly, I never slept more soundly. The barometer at sunset was 26.010, thermometer 81°, and cloudy; but a gale from the west sprang up with the setting sun, and in a few minutes swept away every cloud from the sky. The evening was very fine, and I remained up to take some astronomical observations, which made our position in latitude 40° 51' 17", and longitude 103° 35' 04".

July 7.—At our camp this morning, at 6 o'clock, the barometer was at 26.183, thermometer 69°, and clear, with a light wind from the southwest. The past night had been squally, with high winds, and occasionally a few drops of rain. Our cooking did not occupy much time, and we left camp early. Nothing of interest occurred during the morning. The same dreary barrenness, except that a hard marly clay had replaced the sandy soil. Buffalo absolutely covered the plain on both sides the river, and whenever we ascended the hills, scattered herds gave life to the view in every direction. A small drove of wild horses made their appearance on the low river bottoms, a mile or two to the left, and I sent off one of the Indians (who seemed very eager to catch one) on my led horse, a spirited and fleet animal. The savage manœuvred a little to get the wind of the horses, in which he succeeded; approaching within a hundred yards without being discovered. The chase for a few minutes was animated and interesting. My hunter easily overtook and passed the hindmost of the wild drove, which the Indian did not attempt to *lasso*; all his efforts being directed to the capture of the leader. But the strength of the horse, weakened by the insufficient nourishment of grass, failed in a race, and all the drove escaped. We halted at noon on the bank of the river, the barometer at that time being 26.192, and the thermometer 103°, with a light air from the south and clear weather.

In the course of the afternoon, dust rising among the hills at a particular place attracted our attention, and riding up we found a band of eighteen or twenty buffalo bulls engaged in a desperate fight. Though butting and goring were bestowed liberally and without distinction, yet their efforts were evidently directed against one, a huge gaunt old bull, very lean, while his adversaries were all fat and in good order. He appeared very weak, and had already received some wounds, and while we were looking on was several times knocked down and badly hurt, and a very few moments would

have put an end to him. Of course we took the side of the weaker party, and attacked the herd, but they were so blind with rage that they fought on, utterly regardless of our presence, although on foot and on horseback we were firing in open view within twenty yards of them. But this did not last long. In a very few seconds we created a commotion among them. One or two which were knocked over by the balls jumped up and ran off into the hills, and they began to retreat slowly along a broad ravine to the river, fighting furiously as they went. By the time they had reached the bottom we had pretty well dispersed them, and the old bull hobbled off to lie down somewhere. One of his enemies remained on the ground where we had first fired upon them, and we stopped there for a short time to cut from him some meat for our supper. We had neglected to secure our horses, thinking it an unnecessary precaution in their fatigued condition; but our mule took it into his head to start, and away he went, followed at full speed by the pack-horse, with all the baggage and instruments on his back. They were recovered and brought back, after a chase of a mile. Fortunately every thing was well secured, so that nothing, not even the barometer, was in the least injured.

The sun was getting low, and some narrow lines of timber four or five miles distant, promised us a pleasant camp, where, with plenty of wood for fire, and comfortable shelter, and rich grass for our animals, we should find clear cool springs, instead of the warm water of the Platte. On our arrival we found the bed of a stream fifty to one hundred feet wide, sunk some thirty feet below the level of the prairie, with perpendicular banks, bordered by a fringe of green cottonwood, but not a drop of water. There were several small forks to the stream all in the same condition. With the exception of the Platte bottom, the country seemed to be of a clay formation, dry, and perfectly devoid of any moisture, and baked hard by the sun. Turning off towards the river, we reached the bank in about a mile, and were delighted to find an old tree with thick foliage and spreading branches, where we encamped. At sunset the barometer was at 25,950, thermometer 81°, with a strong wind from S. 20° E., and the sky partially covered with heavy masses of cloud, which settled a little towards the horizon by 10 o'clock, leaving it sufficiently clear for astronomical observations, which placed us in latitude 40° 33' 26" and longitude 104° 02' 13".

July 8.—The morning was very pleasant. The breeze was fresh from S. 50° E. with few clouds, the barometer at 6 o'clock standing at 25,970, and the thermometer at 70°. Since leaving the forks our route had passed over a country alternately clay and sand, each presenting the same naked waste. On leaving camp this morning, we struck again a sandy region, in which the vegetation appeared somewhat more vigorous than that which we had observed for the last few days, and on the opposite side of the river were some tolerably large groves of timber.

Journeying along, we came suddenly upon a place where the ground was covered with horses tracks, which had been made since the rain, and indicated the immediate presence of Indians in our neighborhood. The buffalo, too, which the day before had been so numerous, were nowhere in sight, another sure indication that there were people near. Riding on, we discovered the carcass of a buffalo recently killed, perhaps the day before. We scanned the horizon carefully with the glass, but no living object was to be seen. For the next mile or two the ground was dotted with buffalo carcasses, which showed that the Indians had made a surround here, and

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were in considerable force. We went on quickly and cautiously, keeping the river bottom, and carefully avoiding the hills; but we met with no interruption, and began to grow careless again. We had already lost one of our horses, and here Basil's mule showed symptoms of giving out, and finally refused to advance, being what the Canadians call *resté*. He therefore dismounted, and drove her along before him, but this was a very slow way of travelling. We had inadvertently got about half a mile in advance, but our Cheyennes, who were generally a mile or two in the rear, remained with him. There were some dark looking objects among the hills, about two miles to the left, here low and undulating, which we had seen for a little time, and supposed to be buffalo, coming in to water; but happening to look behind, Maxwell saw the Cheyennes whipping up furiously, and another glance at the dark objects showed them at once to be Indians coming up at speed.

Had we been well mounted and disencumbered of instruments, we might have set them at defiance, but as it was, we were fairly caught. It was too late to rejoin our friends, and we endeavored to gain a clump of timber, about half a mile ahead, but the instruments and the tired state of our horses did not allow us to go faster than a steady canter, and they were taining on us fast. At first they did not appear to be more than fifteen or twenty in number, but group after group darted into view at the top of the hills, until all the little eminences seemed in motion, and in a few minutes from the time they were first discovered, two or three hundred, naked to the reach cloth, were sweeping across the prairie. In a few hundred yards we discovered that the timber we were endeavoring to make, was on the opposite side of the river, and before we could reach the bank, down came the Indians upon us.

I am inclined to think that in a few seconds more the leading man, and, perhaps, some of his companions, would have rolled in the dust, for we had jerked the covers from our guns, and our fingers were on the triggers; when in such cases generally act from instinct, and a charge from three hundred naked savages is a circumstance not well calculated to promote a cool exercise of judgment. Just as he was about to fire, Maxwell recognised the leading Indian, and shouted to him in the Indian language, 'You're a fool, God damn you, don't you know me?' The sound of his own language seemed to shock the savage, and swerving his horse a little, he passed us like an arrow. He wheeled, as I rode out toward him, and gave me his hand, striking his breast and exclaiming, Arapahó! They proved to be a village of that nation among whom Maxwell had resided as a trader a year or two previously, and recognised him accordingly. We were soon in the midst of the band, answering as well as we could a multitude of questions, of which the very first was, of what tribe were our Indian companions who were coming in the rear? They seemed disappointed to know that they were Cheyennes, for they had fully anticipated a grand dance around a Pawnee scalp that night.

The chief showed us his village at a grove on the river six miles ahead, and pointed out a band of Buffalo, on the other side of the Platte immediately opposite us, which he said they were going to surround. They had seen the band early in the morning from their village, and had been making a large circuit to avoid giving them the wind, when they discovered us.

A few minutes the women came galloping up, astride on their horses,

and naked from the knees down, and the hips up. They followed the men to assist in cutting up and carrying off the meat.

The wind was blowing directly across the river, and the chief requested us to halt where we were, for a while, in order to avoid raising the herd. We, therefore, unsaddled our horses, and sat down on the bank to view the scene, and our new acquaintances rode a few hundred yards lower down and began crossing the river. Scores of wild looking dogs followed, looking like troops of wolves, and having, in fact, but very little of the dog in their composition. Some of them remained with us, and I checked one of the men, whom I found aiming at one, which he was about to kill for a wolf. The day had become very hot. The air was clear, with a very slight breeze, and now, at twelve o'clock, while the barometer stood at 25.920, the attached thermometer was at 108°. Our Cheyennes had learned that with the Arapaho village, were about twenty lodges of their own, including their own families; they, therefore, immediately commenced making their toilette. After bathing in the river, they invested themselves in some handsome calico shirts, which I afterward learned they had stolen from my own men, and spent some time in arranging their hair and painting themselves with some vermilion I had given them. While they were engaged in this satisfactory manner, one of their half wild horses, to which the crowd of prancing animals which had just passed had recalled the freedom of her existence among the wild droves on the prairie, suddenly dashed into the hills at the top of her speed. She was their pack horse, and had on her back all the worldly wealth of our poor Cheyennes, all their accoutrements, and all the little articles which they had picked up among us, with some few presents I had given them. The loss which they seemed to regret most were their spears and shields, and some tobacco which they had received from me. However, they bore it all with the philosophy of an Indian, and laughingly continued their toilette. They appeared, however, a little mortified at the thought of returning to the village in such a sorry plight. "Our people will laugh at us," said one of them, "returning to the village on foot, instead of driving back a drove of Pawnee horses." He demanded to know if I loved my sorrel hunter very much, to which I replied he was the object of my most intense affection. Far from being able to give, I was myself in want of horses, and any suggestion of parting with the few I had valuable, was met with a peremptory refusal. In the meantime the slaughter was about to commence on the other side. So soon as they reached it, the Indians separated into two bodies. One party proceeded directly across the prairie toward the hills in an extended line, while the other went up the river, and instantly as they had given the wind to the herd, the chase commenced. The buffalo started for the hills, but were intercepted and driven back toward the river, broken and running in every direction. The clouds of dust soon covered the whole scene, preventing us from having any but an occasional view. It had a very singular appearance to us at a distance, especially when looking with the glass. We were too far to hear the report of the guns, or any sound, and at every instant, through the clouds of dust which the sun made luminous, we could see for a moment two or three buffalo dashing along, and close behind them an Indian with his long spear, or other weapon, and instantly again they disappeared. The apparent silence, and the dimly seen figures flitting by with such rapidity, gave it a kind of dreamy effect, and seemed more like a picture than a scene of real life. It had been a large herd

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when the *cerne* commenced, probably, three or four hundred in number; but, though I watched them closely, I did not see one emerge from the fatal cloud where the work of destruction was going on. After remaining here about an hour, we resumed our journey in the direction of the village.

Gradually as we rode on, Indian after Indian came dropping along, laden with meat; and by the time we had neared the lodges, the backward pad was covered with the returning horsemen. It was a pleasant contrast with the desert road we had been travelling. Several had joined company with us, and one of the chiefs invited us to his lodge. The village consisted of about one hundred and twenty-five lodges, of which twenty were Cheyennes; the latter pitched a little apart from the Arapaho. They were disposed in a scattering manner on both sides of a broad regular street, about one hundred and fifty feet wide, and running along the river. As we rode along, I remarked near some of the lodges a kind of tripod frame, formed of three slender poles of birch, scraped very clean, to which were affixed the shield and spear, with some other weapons of a chief. All were scrupulously clean, the spear head was burnished bright, and the shield white and stainless. It reminded me of the days of feudal rivalry, and when as I rode by I yielded to the passing impulse, and touched one of the spotless shields with the muzzle of my gun, I almost expected a grim warrior to start from the lodge and resent my challenge. The master of the lodge spread out a robe for me to sit upon, and the gunwags set before us a large wooden dish of buffalo meat. He had lit his pipe in the meanwhile, and when it had been passed around, we commenced our dinner while he continued to smoke. Gradually five or six other chiefs came in and took their seats in silence. When we had finished, our host asked a number of questions relative to the object of our journey, of which I made no concealment; telling him simply that I had made visit to see the country, preparatory to the establishment of military posts on the way to the mountains. Although this was information of the highest interest to them, and by no means calculated to please them, it excited no expression of surprise, and in no way altered the grave courtesy of their demeanor. The others listened and smoked. I remarked, that in taking the pipe for the first time, each had turned the stem upward, with a rapid lance, as in offering to the Great Spirit, before he put it in his mouth. A storm had been gathering for the past hour, and some pattering drops on the lodge warned us that we had some miles to our camp. Some Indian had given Maxwell a bundle of dried meat, which was very acceptable, as we had nothing, and springing upon our horses, we rode off at dusk in the face of a cold shower and driving wind. We found our companions under some densely foliated old trees, about three miles up the river. Under one of them lay the trunk of a large cottonwood, to leeward of which the men had kindled a fire, and we sat here and roasted our meat in tolerable shelter. Nearly opposite was the mouth of one of the most considerable affluents of the South fork, *la Fourche aux Castors* (Beaver fork), heading off to the ridge to the southeast.

July 9.—This morning we caught the first faint glimpse of the Rocky Mountains, about sixty miles distant. Though a tolerably bright day, there was a slight mist, and we were just able to discern the snowy summit of "Long's peak," (*les deux oreilles* of the Canadians,) showing like a small cloud near the horizon. I found it easily distinguishable, there being perceptible difference in its appearance from the white clouds that were

floating about the sky. I was pleased to find that among the traders and voyageurs the name of "Long's peak" had been adopted and become familiar in the country. In the ravines near this place, a light brown sandstone made its first appearance. About 8, we discerned several persons on horseback a mile or two ahead on the opposite side of the river. They turned in towards the river, and we rode down to meet them. We found them to be two white men, and a mulatto named Jim Beckwith, who had left St. Louis when a boy, and gone to live with the Crow Indians. He had distinguished himself among them by some acts of daring bravery, and had risen to the rank of a chief, but had now, for some years, left them. They were in search of a band of horses that had gone off from a camp some miles above, in charge of Mr. Chabonard. Two of them continued down the river, in search of the horses, and the American turned back with us, and we rode on towards the camp. About eight miles from our sleeping place we reached Bjou's fork, an affluent of the right bank. Where we crossed it, a short distance from the Platte, it has a sandy bed about four hundred yards broad, the water in various small streams, a few inches deep. Seven miles further brought us to a camp of sons of four or five whites, New Englanders, I believe, who had accompanied Capt. Wyeth to the Columbia river, and were independent trappers. All had their squaws with them, and I was really surprised at the number of little fat buffalo-few boys, that were tumbling about the camp, all apparently of the same age, about three or four years old. They were encamped on a rich bottom covered with a profusion of fine grass, and had a large number of fine looking horses and mules. We rested with them a few minutes, and about two miles arrived at Chabonard's camp, on an island in the Platte. On the heights above, we met the first Spaniard I had seen in the country. Mr. Chabonard was in the service of Bent and St. Vrain's company, and had left their fort some forty or fifty miles above, in the spring, with boats laden with the furs of the last year's trade. He had met the same fortune as the voyageurs on the North fork, and finding it impossible to proceed had taken up his summer's residence on this island, which he had named St. Helena. The river hills appeared to be composed entirely of sand, and the Platte had lost the muddy character of its waters, and here was tolerably clear. From the mouth of the South fork, I had found it occasionally broken up by small islands, and at the time of our journey, which was at season of the year when the waters were at a favorable stage, it was not navigable for anything drawing six inches water. The current was very swift—the bed of the stream a coarse gravel.

From the place at which we had encountered the Arapahoes, the Platte had been tolerably well fringed with timber, and the island here had a fine grove of very large cottonwoods, under whose broad shade the tents were pitched. There was a large drove of horses in the opposite prairie bottom, smoke was rising from the scattered fires, and the encampment had quite a patriarchal air. Mr. C. received us hospitably. One of the people was sent to gather mint, with the aid of which he concocted very good julep, and some boiled buffalo tongue, and coffee with the luxury of sugar, were soon served before us. The people in his employ were generally Spaniards, and among them I saw a young Spanish woman from Taos, whom I found to be Beckwith's wife.

July 10.—We parted with our hospitable host after breakfast the next morning, and reached St. Vrain's fort, about forty-five miles from St. Helena

te in the immediate vicinity of the fort. It is on the north side of the river, above the mouth of the South fork, which it receives from the water of the lower Platte. The fort is a small one, and the Spaniards are generally poor. There are of course many Spaniards in the Platte, but they are confined to the lower Platte. Here, at a few hours, I regretted the fact of my departure to an Arapahoe region, as informed by the Spaniards from the mouth of the North fork, and finding it impossible to proceed, had taken up his summer's residence on this island, which he had named St. Helena. The river hills appeared to be composed entirely of sand, and the Platte had lost the muddy character of its waters, and here was tolerably clear. From the mouth of the South fork, I had found it occasionally broken up by small islands, and at the time of our journey, which was at season of the year when the waters were at a favorable stage, it was not navigable for anything drawing six inches water. The current was very swift—the bed of the stream a coarse gravel.

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te in the evening. This post is situated on the South fork of the Platte, immediately under the mountains, about seventeen miles east of Long's peak. It is on the right bank, on the verge of the upland prairie, about forty feet above the river, of which the immediate valley is about six hundred yards wide. The stream is divided into various branches by small islands, among which it runs with a swift current. The bed of the river is sand and gravel, the water very clear, and here may be called a mountain stream. This region appears to be entirely free from the limestones and marls which give to the lower Platte its yellow and dirty color. The Black hills lie between the stream and the mountains, whose snowy peaks glitter a few miles beyond. At the fort we found Mr. St. Vrain, who received us with much kindness and hospitality. Maxwell had spent the last two or three years between this post and the village of Taos, and here he was at home and among his friends. Spaniards frequently come over in search of employment, and several came shortly after our arrival. They usually obtain about six dollars a month, generally paid to them in goods. They are very useful in a camp in taking care of horses and mules, and I engaged one who proved to be an active, laborious man, and was of very considerable service to me. The elevation of the Platte here is 5,400 feet above the sea. The neighboring mountains did not appear to enter far the region of perpetual snow, which was generally confined to the northern side of the peaks. On the southern I remarked very little. Here it appeared, so far as I could judge in the distance, to descend but a few hundred feet below the summits.

I regretted that time did not permit me to visit them; but the proper object of my survey lay among the mountains further north, and I looked forward to an exploration of their snowy recesses with great pleasure. The snowy region of the mountains to the south was enveloped in smoke, and I was informed had been on fire for several months. Pike's peak is said to be visible from this place, about 100 miles to the southward, but the smoky state of the atmosphere prevented my seeing it. The weather continued overcast during my stay here, so that I failed in determining the latitude, but obtained good observations for time on the mornings of the 11th and 12th. I assumed latitude of $40^{\circ} 22' 30''$ from the evening position of the 12th, enabled me to obtain for a tolerable correct longitude $105^{\circ} 45' 13''$.

July 12.—The kindness of Mr. St. Vrain had enabled me to obtain a couple of horses and three good mules, and with a further addition to our party of the Spaniard whom I had hired, and two others, who were going to obtain service at Laramie's fork, we resumed our journey at 10 on the morning of the 12th. We had been able to procure nothing at the post in the way of provision. An expected supply from Taos had not yet arrived, and a few pounds of coffee was all that could be spared to us. In addition to this, we had dried meat enough for the first day; on the next we expected to find buffalo. From this post, according to the estimate of the country, the fort at the mouth of Laramie's fork, which was our next point of destination, was nearly due north, distant about one hundred and twenty-five miles. For a short distance our road lay down the valley of the Platte; which resembled a garden in the splendor of fields of varied flowers, which filled the air with fragrance. The only timber I noticed consisted of poplar, birch, cottonwood, and willow. In something less than three miles, we crossed Thompson's creek, one of the affluents to the left bank of the South fork, a stream about sixty-five feet wide and three feet deep. Journeying on, the low dark line of the Black hills lying between us and the mountains to

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the left, in about ten miles from the fort, we reached *Cacha de la Poudre* where we halted to noon. This is a very beautiful mountain stream, about one hundred feet wide, flowing with a full swift current over a rocky bed. We halted under the shade of some cottonwoods, with which the stream is wooded scatteringly. In the upper part of its course, it runs amid the wildest mountain scenery, and breaking through the Black Hills falls into the Platte about ten miles below this place. In the course of our late journey, I had managed to become the possessor of a very untractable mule, a perfect vixen, and her I had turned over to my Spaniard. It occupied us about half an hour to-day to get the saddle upon her; but, once on her back, Jose could not be dismounted, realizing the accounts given of Mexican horses and horsemanship; and we continued our route in the afternoon.

At evening we encamped on Crow (?) creek, having travelled about twenty-eight miles. None of the party were well acquainted with the country, and I had great difficulty in ascertaining what were the names of the streams we crossed between the North and South forks of the Platte. This I supposed to be Crow creek. It is what is called a salt stream, and the water stands in pools, having no continuous course. A fine grained sandstone made its appearance in the banks. The observations of the night placed us in latitude $40^{\circ} 43'$; longitude $105^{\circ} 33' 27''$. The barometer at sunset was 25.231. Attached thermometer at 66° . Sky clear, except in the east, with a light wind from the north.

July 13.—There being no wood here, we used last night the *bois de cache*, which is very plentiful. At our camp this morning, the barometer was at 25.235, the attached thermometer 60° . A few clouds were moving through a deep blue sky, with a light wind from the west. After a ride of twelve miles, in a northeasterly direction, over a plain covered with innumerable quantities of *cacti*, we reached a small creek in which there was water, and where several herds of buffalo were scattered about among the ravines which always afford good pasturage. We seem now to be passing along the base of a plateau of the Black hills, in which the formation consists of marls, some of them white and laminated, the country to the left rising suddenly and falling off gradually and uniformly to the right. In five or six miles of a northeasterly course, we struck a high ridge, broken into conical peaks, on whose summits large boulders were gathered in heaps. The magnetic direction of the ridge is northwest and southeast, the glittering white of its precipitous sides making it visible for many miles to the south. It is composed of a soft earthy limestone, and marls resembling that hereafter described, in the neighborhood of the Chimney Rock, on the North fork of the Platte, easily worked by the winds and rains, and sometimes moulded into very fantastic shapes. At the foot of the northern slope was the bed of a creek some forty feet wide, coming by frequent falls from the bench above. It was shut in by high perpendicular banks, in which were strata of white laminated marl; its bed was perfectly dry, and the leading feature of the whole region is one of remarkable aridity, and perfect freedom from moisture. In about six miles we crossed the bed of another dry creek; and continuing our ride over a high level prairie, a little before sundown we came suddenly upon a beautiful creek, which revived us with a feeling of delighted surprise by the pleasant contrast of the deep verdure of its banks, with the parched desert we had passed. We had suffered much to-day, both men and horses, for want of water; having met with

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"*Las bestias tienen mucha hambre,*" said the young Spaniard, inquiringly, "*y la gente tambien,*" said I, "awake" we'll camp here. A stream of good and clear water ran winding about through the little valley, and a herd of buffalo were quietly feeding a little distance below. It was quite a hunter's paradise; and while some ran down toward the band to kill one for supper, others collected *bois de vache*, for a fire, there being no wood; and I amused myself with hunting for plants among the grass.

It will be seen, by occasional remarks on the geological formation, that the constituents of the soil in these regions are good, and every day served to strengthen the impression in my mind, confirmed by subsequent observation, that the barren appearance of the country, is due almost entirely to the extreme dryness of the climate. Along our route the country had seemed to increase constantly in elevation. According to the indication of the barometer, we were at our encampment, 5,440 feet above the sea.

The evening was very clear, with a fresh breeze from the south, 50° east. The barometer at sunset was 24.862, the thermometer attached showing 68°. I supposed this to be a fork of Lodge Pole creek, so far as I could determine from our uncertain means of information. Astronomical observations gave for the camp a longitude of 105° 13' 38", and latitude 41° 08' 31".

July 14th.—The wind continued fresh from the same quarter in the morning, the day being clear with the exception of a few clouds in the horizon. At our camp at six o'clock, the height of the barometer was 24.830, the attached thermometer 61°. Our course this morning was directly north, by compass, the variation being 15° or 16° easterly. A ride of four miles brought us to Lodge Pole creek, which we had seen at its mouth on the South fork; crossing on the way two dry streams, in eighteen miles from our encampment of the past night we reached a high bleak ridge, composed entirely of the same earthy limestone and marl previously described. I had never seen anything which impressed so strongly on my mind a feeling of desolation. The valley through which ran the waters of Horse creek, lay in view to the north, but too far to have any influence on the immediate view. On the peak of the ridge where I was standing, some six or seven hundred feet above the river, the wind was high and bleak; the barren and arid country seemed as if it had been swept by fires, and in every direction the same dull ash-colored hue, derived from the formation, met the eye. On the summits were some stunted pines, many of them dead, all wearing the same ashen hue of desolation. We left the place with pleasure; and after we had descended several hundred feet, halted in one of the ravines, which, at the distance of every mile or two, cut the flanks of the ridge with little rushing streams, wearing something of a mountain character. We had already begun to exchange the comparatively barren lands for those of a more fertile character. Though the sandstone formed the broken banks of the creek, yet they were covered with a thin grass; and the fifty or sixty feet which formed the bottom land of the little stream, was clothed with very luxuriant grass, among which I remarked willow and cherry, (*cerasus virginiana*;) and a quantity of gooseberry and currant bushes occupied the greater part.

The creek was three or four feet broad and about six inches deep, with a swift current of clear water, and tolerably cool. We had struck it too low down to find the cold water, which we should have enjoyed nearer to its

sources. At 2, P. M., the barometer was at 25.050, the attached thermometer 104°. A day of hot sunshine, with clouds, and a moderate breeze from the south. Continuing down the stream, in about four miles we reached its mouth, at one of the main branches of Horse creek. Looking back upon the ridge whose direction appeared to be a little to the north of east, we saw it seemed at frequent intervals with the dark lines of wooded streamlets, affluents of the river that flowed so far as we could see along its base. We crossed in the space of twelve miles from our noon halt three or four forks of Horse creek, and encamped at sunset on the most easterly.

The fork on which we encamped appeared to have followed an easterly direction up to this place, but here it makes a very sudden bend to the north, passing between two ranges of precipitous hills called, as I was informed, Goshen's hole. There is somewhere in or near this locality a place so called, but I am not certain that it was the place of our encampment. Looking back upon the spot at the distance of a few miles to the northward, the hills appear to shut in the prairie, through which runs the creek, with a semi-circular sweep, which might very naturally be called a hole in the hills. The geological composition of the ridge is the same which constitutes the rock of the Court-house and Chimney on the North fork, which appeared to me a continuation of this ridge. The winds and rains work this formation into a variety of singular forms. The pass into Goshen's hole is about two miles wide, and the hill on the western side imitates, in an extraordinary manner, a massive fortified place, with a remarkable fulness of detail. The rock is marl and earthy limestone, white, without the least appearance of vegetation, and much resembles masonry at a little distance; and here it sweeps around a level area two or three hundred yards in diameter, and in the form of a half moon, terminating on either extremity in enormous bastions. Along the whole line of the parapets appear domes and slender minarets, forty or fifty feet high, giving it every appearance of an old fortified town. On the waters of White river, where this formation exists in great extent, it presents appearances which excite the admiration of the solitary voyageur, and form a frequent theme of their conversation when speaking of the wonders of the country. Sometimes it offers the perfectly illusive appearance of a large city, with numerous streets and magnificent buildings, among which the Canadians never fail to see their *cabaret*; and sometimes it takes the form of a solitary house, with many large chambers, into which they drive their horses at night, and sleep in these natural defences perfectly secure from any attack of prowling savages. Before reaching our camp at Goshen's hole, in crossing the immense detritus at the foot of the Castle rock, we were involved amidst winding passages cut by the waters of the hill; and where, with a breadth scarcely large enough for the passage of a horse, the walls rise thirty and forty feet perpendicularly. This formation supplies the discoloration of the Platte. At sunset, the height of the mercurial column was 25.500, the attached thermometer 80°, and wind moderate from S. 38° E. Clouds covered the sky with the rise of the moon, but I succeeded in obtaining the usual astronomical observations, which placed us in latitude 41° 40' 13", and longitude 104° 59' 23".

July 15.—At 6 this morning, the barometer was at 25.515, the thermometer 72°, the day was fine, with some clouds looking dark on the south, with a fresh breeze from the same quarter. We found that in our journey across the country we had kept too much to the eastward. This morning accordingly we travelled by compass some 15 or 20° to the west of north, and

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struck the Platte some thirteen miles below Fort Laramie. The day was extremely hot, and among the hills the wind seemed to have just issued from an oven. Our horses were much distressed, as we had travelled hard, and it was with some difficulty that they were all brought to the Platte; which we reached at 1 o'clock. In riding in towards the river, we found the trail of our carts, which appeared to have passed a day or two since.

After having allowed our animals two hours for food and repose, we resumed our journey, and towards the close of the day came in sight of Laramie's fork. Issuing from the river hills, we came first in view of Fort Platte, a post belonging to Messrs. Sybille, Adams & Co., situated immediately in the point of land at the junction of Laramie with the Platte. Like the post we had visited on the South fork, it was built of earth, and still unfinished, being enclosed with walls, or rather houses, on three of the sides, and open on the fourth to the river. A few hundred yards brought us in view of the post of the American Fur Company, called Fort John or Laramie. This was a large post, having more the air of military construction than the fort at the mouth of the river. It is on the left bank, on a rising ground some twenty-five feet above the water; and its lofty walls, whitewashed and picketed, with the large bastions at the angles, gave it quite an imposing appearance in the uncertain light of evening. A cluster of lodges, which the language told us belonged to Sioux Indians, was pitched under the walls, and, with the fine background of the Black Hills and the prominent peak of Laramie mountain, strongly drawn in the clear light of the western sky, where the sun had already set, the whole formed at the moment a strikingly beautiful picture. From the company at St. Louis I had letters for Mr. Boudreau, the gentleman in charge of the post, by whom I was received with great hospitality and an efficient kindness, which was invaluable to me during my stay in the country. I found our people encamped on the bank a short distance above the fort. All were well, and in the enjoyment of a bountiful supper, which coffee and bread made luxurious to us, we soon forgot the fatigues of the last ten days.

July 16.—I found that, during my absence, the situation of affairs had undergone some change; and the usual quiet and somewhat monotonous regularity of the camp had given place to excitement and alarm. The circumstances which occasioned this change will, be found narrated in the following extract from the journal of Mr. Preuss, which commences with the day of our separation on the South fork of the Platte.

Extract from the Journal of Mr. Preuss.

"July 6.—We crossed the plateau or highland between the two forks in about six hours. I let my horse go as slow as he liked, to indemnify us both for the previous hardship; and about noon we reached the North fork. There was no sign that our party had passed; we rode, therefore, to some pine trees, unsaddled the horses, and stretched our limbs on the grass, awaiting the arrival of our company. After remaining here two hours, my companion became impatient, mounted his horse again, and rode off down the river to see if he could discover our people. I felt so marode yet, that it was a horrible idea to me to bestride that saddle again, so I lay still. I knew they could not come any other way, and then my companion, one of the best men of the company, would not abandon me. The sun went down; he did not

come ; uneasy I did not feel, but very hungry ; I had no provisions, but I could make a fire ; and, as I espied two doves in a tree, I tried to kill one ; but it needs a better marksmen than myself to kill a little bird with a rifle. I made a large fire, however, lighted my pipe—this true friend of mine in every emergency—laid down, and let my thoughts wander to the far East. It was not many minutes after when I heard the tramp of a horse, and my faithful companion was by my side. He had found the party, who had been delayed by making their *cachs*, about seven miles below. To the good supper which he brought with him I did ample justice. He had forgotten salt ; and I tried the soldier's substitute in time of war, and used gunpowder ; but it answered badly—bitter enough, but no flavor of kitchen salt. I slept well ; and was only disturbed by two owls, which were attracted by the fire, and took their place in the tree under which we slept. Their music seemed as disagreeable to my companion as to myself ; he fired his rifle twice, and then they let us alone.

July 7.—At about 10 o'clock, the party arrived ; and we continued our journey through a country which offered but little to interest the traveller. The soil was much more sandy than in the valley below the confluence of the forks, and the face of the country no longer presented the refreshing green which had hitherto characterized it. The rich grass was now found only in dispersed spots, on low grounds, and on the bottom land of the streams. A long drought, joined to extreme heat, had so parched up the upper prairies, that they were in many places bald, or covered only with a thin growth of yellow and poor grass. The nature of the soil renders it extremely susceptible to the vicissitudes of the climate. Between the forks, and from their junction to the Black Hills, the formation consists of marl and a soft earthy limestone, with granitic sandstone. Such a formation can not give rise to a sterile soil ; and on our return in September, when the country had been watered by frequent rains, the valley of the Platte looked like a garden ; so rich was the verdure of the grasses, and so luxuriant the bloom of abundant flowers. The wild sage begins to make its appearance, and timber is so scarce that we generally made our fires of the *bois de vache*. With the exception of now and then an isolated tree or two, standing like a lighthouse on the river bank, there is none whatever to be seen.

July 8.—Our road to-day was a solitary one. No game made its appearance, not even a buffalo or a stray antelope ; and nothing occurred to break the monotony until about 5 o'clock, when the caravan made a sudden halt. There was a galloping in of scouts and horsemen from every side—a hurrying to and fro in noisy confusion ; rifles were taken from their cover ; bullet pouches examined : in short, there was the cry of "Indians" heard again. I had become so much accustomed to these alarms, that now they made but little impression on me ; and, before I had time to become excited, the new comers were ascertained to be whites. It was a large party of traders and trappers, conducted by Mr. Bridger, a man well known in the history of the country. As the sun was low, and there was a fine grass patch not far ahead, they turned back and encamped for the night with us. Mr. Bridger was invited to supper ; and, after the *table-cloth* was removed, we listened with eager interest to an account of their adventures. What they had met, we would be likely to encounter ; the chances which had befallen them would probably happen to us ; and we looked upon their life as a picture of our own. He informed us that the condition of the country had become exceedingly dangerous. The Sioux, who had been badly disposed, had broken out into

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open hostility, and in the preceding autumn, his party had encountered them in a severe engagement, in which a number of lives had been lost on both sides. United with the Cheyenne and Gros Ventre Indians, they were scouring the upper country in war parties of great force, and were at this time in the neighborhood of the *Red Buttes*, a famous landmark, which was directly on our path. They had declared war upon every living thing which should be found westward of that point; though their main object was to attack a large camp of whites and Snake Indians, who had a rendezvous in the Sweet Water valley. Availing himself of his intimate knowledge of the country, he had reached Laramie by an unusual route through the Black Hills, and avoided coming into contact with any of the scattered parties. This gentleman offered his services to accompany us so far as the head of the Sweet Water; but the absence of our leader, which was deeply regretted by us all, rendered it impossible for us to enter upon such arrangement. In a camp consisting of men whose lives had been spent in this country, I expected to find every one prepared for occurrences of this nature; but, to my great surprise, I found, on the contrary, that this news had thrown them all into the greatest consternation, and on every side I heard only one exclamation, "*Il n'y aura pas de vie pour nous.*" All the night scattered groups were assembled around the fires, smoking their pipes, and listening with the greatest eagerness to exaggerated details of Indian hostilities; and in the morning I found the camp dispirited, and agitated by a variety of conflicting opinions. A majority of the people were strongly disposed to return; but Clément Lambert, with some five or six others, professed their determination to follow Mr. Fremont to the uttermost limit of his journey. The others yielded to their remonstrances; and, somewhat ashamed of their cowardice, concluded to advance at least so far as Laramie fork, eastward of which they were aware no danger was to be apprehended. Notwithstanding the confusion and excitement, we were very early on the road, as the days were extremely hot, and we were anxious to profit by the freshness of the morning. The soft marly formation, over which we were now journeying frequently offers to the traveller views of remarkable and picturesque beauty. To several of these localities where the winds and the rain have worked the bluffs into curious shapes, the voyageurs have given names according to some fancied resemblance. One of these, called the *Courthouse*, we passed about six miles from our encampment of last night, and toward noon came in sight of the celebrated *Chimney Rock*. It looks, at this distance of about thirty miles, like what it is called, the long chimney of a steam-factory establishment, or a shot-tower in Baltimore. Nothing occurred to interrupt the quiet of the day; and we encamped on the river, after a march of twenty-four miles. Buffalo had become very scarce, and but one cow had been killed, of which the meat had been cut into thin slices, and hung around the carts to dry.

July 10.—We continued along the same fine, plainly beaten road, which the smooth surface of the country afforded us for a distance of six hundred and thirty miles, from the frontiers of Missouri to the Laramie fork. In the course of the day we met some whites, who were following along in the train of Mr. Bridger; and, after a day's journey of twenty-four miles, encamped about sunset at the Chimney Rock, of which the annexed drawing will render any description unnecessary. It consists of marl and earthy limestone, and the weather is rapidly diminishing its height; which is now not more

than two hundred feet above the river. Travellers who visited it some years since placed its height at upwards of five hundred feet.

July 11.—The valley of the North fork is of a variable breadth, from one to four and sometimes six miles. Fifteen miles from the Chimney Rock we reached one of those places where the river strikes the bluffs and forces the road to make a considerable circuit over the uplands. This presented an escarpment on the river of about nine hundred yards in length, and is familiarly known as Scott's bluffs. We had made a journey of thirty miles before we again struck the river, at a place where some scanty grass afforded an insufficient pasturage to our animals. About twenty miles from the Chimney Rock, we had found a very beautiful spring of excellent and cold water, but it was in such a deep ravine, and so small, that the animals could not profit by it, and we, therefore, halted only a few minutes, and found a resting place ten miles further on. The plain between Scott's bluffs and Chimney Rock was almost entirely covered with drift wood, consisting principally of cedar, which, we were informed, had been supplied from the Black Hills, in a flood five or six years since.

July 12.—Nine miles from our encampment of yesterday we crossed Horse creek, a shallow stream of clear water about seventy yards wide, falling into the Platte on the right bank. It was lightly timbered, and great quantities of drift wood were piled up on the banks, appearing to be supplied by the creek from above. After a journey of twenty-six miles, we encamped on a rich bottom, which afforded fine grass to our animals. Buffalo have entirely disappeared, and we live now upon the dried meat, which is exceedingly poor food. The marl and earthy limestone which constituted the formation for several days past, had changed during the day into a compact white, or grayish white limestone, sometimes containing hornstone; and at the place of our encampment this evening some strata in the river hills cropped out to the height of thirty or forty feet, consisting of a fine-grained granitic sandstone; one of the strata closely resembling gneiss.

July 13.—To-day about four o'clock we reached Fort Laramie, where we were cordially received; we pitched our camp a little above the fort, on the bank of Laramie river, in which the pure and clear water of the mountain stream looked refreshingly cool, and made a pleasant contrast to the muddy, yellow waters of the Platte."

I walked up to visit our friends at the fort, which is a quadrangular structure, built of clay, after the fashion of the Mexicans, who are generally employed in building them. The walls are about fifteen feet high, surmounted with a wooden palisade, and form a portion of ranges of houses, which entirely surround a yard of about one hundred and thirty feet square. Every apartment has its door and window, all, of course, opening on the inside. There are two entrances opposite each other and midway the wall, one of which is a large and public entrance, the other smaller and more private: a sort of postern gate. Over the great entrance is a square tower, with loopholes; and, like the rest of the work, built of earth. At two of the angles, and diagonally opposite each other, are large square bastions, so arranged as to sweep the four faces of the walls.

This post belongs to the American Fur Company, and, at the time of our visit, was in charge of Mr. Boudeau. Two of the company's clerks, Messrs. Galpin and Kellogg, were with him, and he had in the fort about sixteen men. As usual, these had found wives among the Indian squaws; and, with

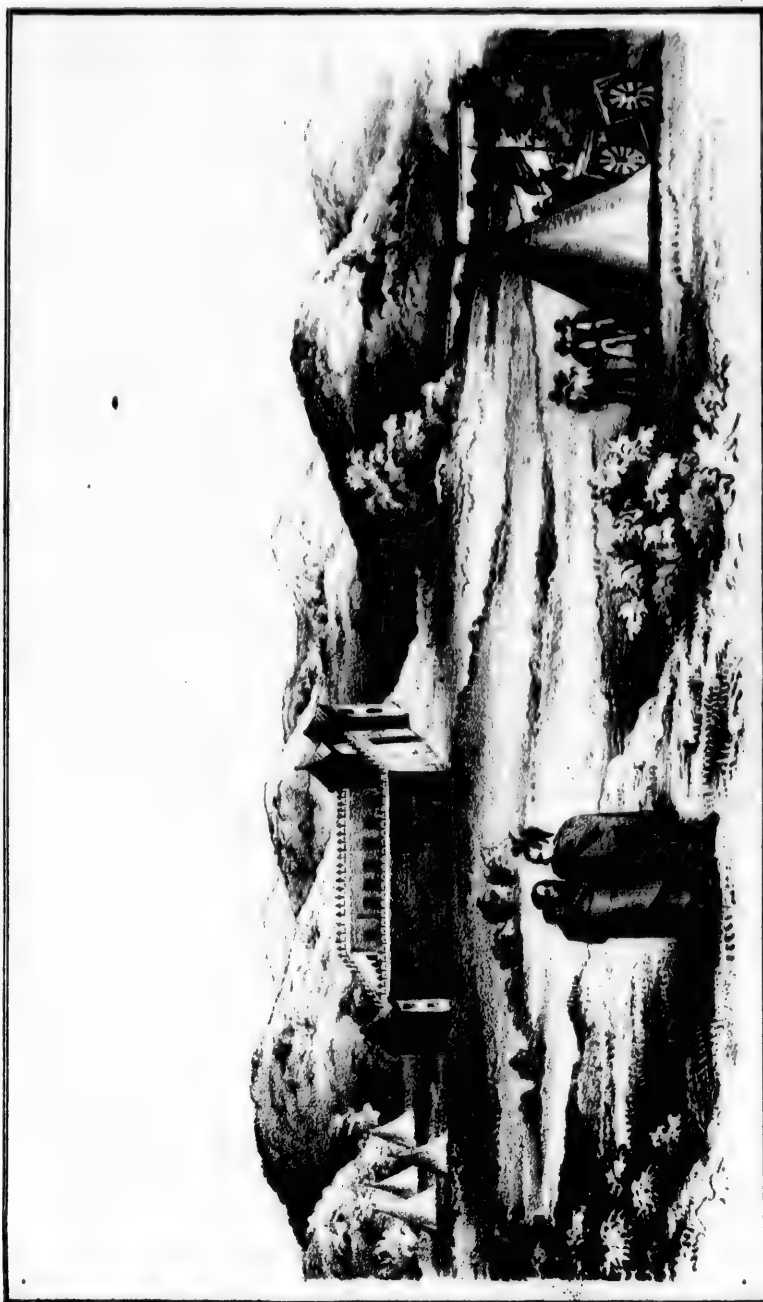
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the usual accompaniment of children, the place had quite a populous appearance. It is hardly necessary to say, that the object of the establishment is trade with the neighboring tribes, who, in the course of the year, generally make two or three visits to the fort. In addition to this, traders with a small outfit are constantly kept among them. The articles of trade consist on the one side almost entirely of buffalo robes, and on the other, of blankets, calicoes, guns, powder, and lead, with such cheap ornaments as glass beads, looking glasses, rings, vermilion for painting, tobacco, and principally, and in spite of the prohibition, of spirits, brought into the country in the form of alcohol, and diluted with water before sold. While mentioning this fact, it is but justice to the American Fur Company to state, that throughout the country, I have always found them strenuously opposed to the introduction of spirituous liquors. But in the present state of things, when the country is supplied with alcohol, when a keg of it will purchase from an Indian every thing he possesses—his furs, his lodge, his horses, and even his wife and children—and when any vagabond who has money enough to purchase a mule can go into a village and trade against them successfully—without withdrawing entirely from the trade, it is impossible for them to discontinue its use. In their opposition to this practice, the company is sustained, not only by their obligation to the laws of the country and the welfare of the Indians, but clearly, also, on grounds of policy; for, with heavy and expensive outfits, they contend at manifestly great disadvantage against the numerous independent and unlicensed traders, who enter the country from various avenues, from the United States and from Mexico, having no other stock in trade than some kegs of liquor, which they sell at the modest price of thirty-six dollars per gallon. The difference between the regular trader and the *coureurs des bois*, as the French call the itinerant or peddling traders, with respect to the sale of spirits, is here as it always has been, fixed and permanent, and growing out of the nature of their trade. The regular trader looks ahead, and has an interest in the preservation of the Indians, and in the regular pursuit of their business, and their preservation of their arms, horses, and everything necessary to their future and permanent success in hunting; the *coureur des bois* has no permanent interest, and gets what he can, and for what he can, from every Indian he meets, even at the risk of disabling him from doing anything more at hunting.

The fort had a very cool and clean appearance. The great entrance, in which I found the gentlemen assembled, and which was floored, and about fifteen feet long, made a pleasant, shaded seat, through which the breeze swept constantly; for this country is famous for high winds. In the course of conversation, I learned the following particulars, which will explain the condition of the country. For several years the Cheyennes and Sioux had gradually become more and more hostile to the whites, and in the latter part of August, 1841, had had a rather severe engagement with a party of sixty men under the command of Mr. Frapp, of St. Louis. The Indians lost eight or ten warriors, and the whites had their leader and four men killed. This fight took place on the waters of Snake river; and it was this party, on their return under Mr. Bridger, which had spread so much alarm among my people. In the course of the spring, two other small parties had been cut off by the Sioux; one on their return from the Crow nation, and the other among the Black Hills. The emigrants to Oregon and Mr. Bridger's party met here, a few days before our arrival. Division and misunderstandings had grown up among them; they were already somewhat disheartened by the fatigue of their long and wearisome journey, and the feet of their cattle

had become so much worn as to be scarcely able to travel. In this situation, they were not likely to find encouragement in the hostile attitude of the Indians, and the new and unexpected difficulties which sprang up before them. They were told that the country was entirely swept of grass, and that few or no buffalo were to be found on their line of route; and with their weakened animals, it would be impossible for them to transport their heavy wagons over the mountain. Under these circumstances, they disposed of their wagons and cattle at the forts; selling them at the prices they had paid in the States, and taking in exchange coffee and sugar at one dollar a pound, and miserable worn out horses, which died before they reached the mountains. Mr. Boudeau informed me that he had purchased thirty, and the lower fort eighty head of fine cattle, some of them of the Durham breed. Mr. Fitzpatrick, whose name and high reputation are familiar to all who interest themselves in the history of this country, had reached Laramie in company with Mr. Bridger; and the emigrants were fortunate enough to obtain his services to guide them as far as the British post of Fort Hall, about two hundred and fifty miles beyond the South Pass of the mountains. They had started for this post on the fourth of July, and immediately after their departure, a war party of three hundred and fifty braves sat out upon their trail. As their principal chief or partisan had lost some relations in the recent fight, and had sworn to kill the first whites on his path, it was supposed that their intention was to attack the party, should a favorable opportunity offer; or, if they were foiled in their principal object by the vigilance of Mr. Fitzpatrick, content themselves with stealing horses and cutting off stragglers. These had been gone but a few days previous to our arrival.

The effect of the engagement with Mr. Frapp had been greatly to irritate the hostile spirit of the savages; and immediately subsequent to that event, the Gros Ventre Indians had united with the Oglallahs and Cheyennes, and taken the field in great force, so far as I could ascertain, to the amount of eight hundred lodges. Their object was to make an attack on a camp of Snake and Crow Indians, and a body of about one hundred whites, who had made a rendezvous somewhere in the Green River valley, or on the Sweet Water. After spending sometime in buffalo hunting in the neighborhood of the Medicine Bow mountain, they were to cross over to the Green River waters, and return to Laramie by way of the South Pass and the Sweet Water valley. According to the calculation of the Indians, Mr. Boudeau informed me, they were somewhere near the head of the Sweet Water. I subsequently learned that the party led by Mr. Fitzpatrick were overtaken by their pursuers, near Rock Independence, in the valley of the Sweet Water; but his skill and resolution saved them from surprise, and small as his force was, they did not venture to attack him openly. Here they lost one of their party by an accident, and continuing up the valley, they came suddenly upon the large village. From these they met with a doubtful reception. Long residence and familiar acquaintance had given to Mr. Fitzpatrick great personal influence among them, and a portion of them were disposed to let him pass quietly; but by far the greater number were inclined to hostile measures, and the chiefs spent the whole of one night, during which they kept the little party in the midst of them, in council, debating the question of attacking them the next day; but the influence of the "Broken Hand," as they called Mr. Fitzpatrick (one of his hands having been shattered by the bursting of a gun), at length prevailed, and obtained for them an unmolested passage; but they sternly assured him that this

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In this situation the attitude of the whites was very angry up before the faces of the Indians, and with their hands on their hips they disposed of the money they had at one dollar a piece. They reached the fort thirty, and Durham breed. Similar to all who had Laramie in mind enough to go to Fort Hall, the mountains. Immediately after we sat out upon relations in the path, it was unfavorable opportunity by the vigilance and cutting off our arrival. Greatly to irritate at that event, and Cheyennes, to the amount of a camp of the whites, who valley, or on the edge in the neighbor to the Green Pass and the Indians, Mr. Boue Sweet Water. were overtaken the Sweet Water and small as his they lost one they came sudden reception to Mr. Fitzpatrick. of them were in the night, during council, debating the influence of the hands having, and obtained him that this

path was no longer open, and that any party of whites which should hereafter be found upon it, would meet with certain destruction. From all that I have been able to learn, I have no doubt that the emigrants owe their lives to Mr. Fitzpatrick.

Thus it would appear that the country was swarming with scattered war parties; and when I heard during the day, the various contradictory and exaggerated rumors which were incessantly repeated to them, I was not surprised that so much alarm prevailed among my men. Carson, one of the best and most experienced mountaineers, fully supported the opinion given by Bridger of the dangerous state of the country, and openly expressed his conviction that we could not escape without some sharp encounters with the Indians. In addition to this, he made his will, and among the circumstances which were constantly occurring to increase their alarm, this was the most unfortunate; and I found that a number of my party had become so much intimidated, that they had requested to be discharged at this place. I dined to-day at Fort Platte, which has been mentioned as situated at the junction of Laramie river, with the Nebraska. Here I heard a confirmation of the statements given above. The party of warriors which had started a few days since on the trail of the emigrants, was expected back in fourteen days, to join the village with which their families and the old men had remained. The arrival of the latter was hourly expected, and some Indians have just come in who had left them on the Laramie fork, about twenty miles above. Mr. Bissonette, one of the traders belonging to Fort Platte, urged the propriety of taking with me an interpreter and two or three old men of the village, in which case he thought there would be little or no hazard in encountering any of the war parties. The principal danger was in being attacked before they should know who we were.

They had a confused idea of the numbers and power of our people, and dreaded to bring upon themselves the military force of the United States. This gentleman, who spoke the language fluently, offered his services to accompany me so far as the Red Buttes. He was desirous to join the large party on its return, for purposes of trade, and it would suit his views as well as my own, to go with us to the Buttes; beyond which point it would be impossible to prevail on a Sioux to venture, on account of their fear of the Crows. From Fort Laramie to the Red Buttes, by the ordinary road, is one hundred and thirty-five miles; and, though only on the threshold of danger, it seemed better to secure the services of an interpreter for the partial distance, than to have none at all.

So far as frequent interruption from the Indians would allow, we occupied ourselves in making some astronomical calculations, and bringing up the general map to this stage of our journey, but the tent was generally occupied by a succession of our ceremonious visitors. Some came for presents, and others for information of our object in coming to the country; now and then one would dart up to the tent on horseback, jerk off his trappings, and stand silently at the door, holding his horse by the halter, signifying his desire to trade. Occasionally a savage would stalk in, with an invitation to a feast of honor, a dog feast, and deliberately sit down and wait quietly until I was ready to accompany him. I went to one; the women and children were sitting outside the lodge, and we took our seats on buffalo robes spread around. The dog was in a large pot over the fire in the middle of the lodge, and immediately on our arrival was dished up

in large wooden bowls, one of which was handed to each. The flesh appeared very glutinous, with something of the flavor and appearance of mutton. Feeling something move behind me, I looked round and found that I had taken my seat among a litter of fat young puppies. Had I been nice in such matters, the prejudices of civilization might have interfered with my tranquility; but fortunately, I am not of delicate nerves, and continued quietly to empty my platter.

The weather was cloudy at evening, with a moderate south wind, and the thermometer at 6 o'clock 85°. I was disappointed in my hope of obtaining an observation of an occultation, which took place about midnight. The moon brought with her heavy banks of clouds, through which she scarcely made her appearance during the night.

The morning of the 18th was cloudy and calm, the thermometer at 6 o'clock at 64°. About 9, with a moderate wind from the west, a storm of rain came on, accompanied by sharp thunder and lightning, which lasted about an hour. During the day the expected village arrived, consisting principally of old men, women, and children. They had a considerable number of horses, and large troops of dogs. Their lodges were pitched near the fort, and our camp was constantly crowded with Indians of all sizes, from morning until night; at which time some of the soldiers generally came to drive them all off to the village. My tent was the only place which they respected. Here only came the chiefs and men of distinction, and generally one of them remained to drive away the women and children. The numerous strange instruments applied to still stranger uses excited awe and admiration among them, and those which I used in talking with the sun and stars they looked upon with especial reverence, as mysterious things of "great medicine." Of the three barometers which I had brought with me thus far successfully, I found that two were out of order, and spent the greater part of the 19th in repairing them, an operation of no small difficulty in the midst of the incessant interruptions to which I was subjected. We had the misfortune to break here a large thermometer, graduated to show fifths of a degree, which I used to ascertain the temperature of boiling water, and with which I had promised myself some interesting experiments in the mountains. We had but one remaining on which the graduation extended sufficiently high, and this was too small for exact observations. During our stay here the men had been engaged in making numerous repairs, arranging pack-saddles, and otherwise preparing for the chances of a rough road and mountain travel. All things of this nature being ready, I gathered them around me in the evening, and told them that "I had determined to proceed the next day. They were all well armed. I had engaged the services of Mr. Bissonette as interpreter, and taken, in the circumstances, every possible means to ensure our safety. In the rumors we had heard I believed there was much exaggeration, and then they were men accustomed to this kind of life and to the country; and that these were the dangers of every day occurrence, and to be expected in the ordinary course of their service. They had heard of the unsettled condition of the country before leaving St. Louis, and therefore could not make it a reason for breaking their engagements. Still I was unwilling to take with me on a service of some certain danger men on whom I could not rely; and as I had understood that there were among them some who were disposed to cowardice, and anxious to return, they had but to come forward at once and state their desire, and they would

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be discharged with the amount due to them for the time they had served." To their honor be it said, there was but one among them who had the face to come forward and avail himself of the permission. I asked him some few questions in order to expose him to the ridicule of the men, and let him go. The day after our departure he engaged himself to one of the forts, and set off with a party for the Upper Missouri. I did not think that the situation of the country justified me in taking our young companions, Messrs. Brant and Benton, along with us. In case of misfortune, it would have been thought, at the least, an act of great imprudence; and therefore, though reluctantly, I determined to leave them. Randolph had been the life of the camp, and the "*petit garcon*" was much regretted by the men, to whom his bouyant spirits had afforded great amusement. They all, however, agreed in the propriety of leaving him at the fort, because, as they said, he might cost the lives of some of the men in a fight with the Indians.

July 21.—A portion of our baggage, with our field-notes and observations, and several instruments, were left at the fort. One of the gentlemen, Mr. Galpin, took charge of a barometer, which he engaged to observe during my absence, and I entrusted to Randolph, by way of occupation, the regular winding up of two of my chronometers, which were among the instruments left. Our observations showed that the chronometer which I retained for the continuation of our voyage had preserved its rate in a most satisfactory manner. As deduced from it, the longitude of Fort Laramie is $74^{\circ} 01' 21''$, and from lunar distance $74^{\circ} 01' 29''$, giving for the adopted longitude $105^{\circ} 21' 10''$. Comparing the barometrical observations made during our stay here with those of Dr. G. Engelmann at St. Louis, we find for the elevation of the fort above the Gulf of Mexico 4,470 feet. The winter climate here is remarkably mild for the latitude; but rainy weather is frequent, and the place is celebrated for winds, of which the prevailing one is west. An east wind in summer and a south wind in winter is said to be always accompanied with rain.

We were ready to depart; the tents were struck, the mules geared up, and our horses saddled, and we walked up to the fort to take the *stirrup cup* with our friends in an excellent home-brewed preparation. While thus pleasantly engaged, seated in one of the little cool chambers, at the door of which a man had been stationed to prevent all intrusion from the Indians, a number of chiefs, several of them powerful fine-looking men, forced their way into the room in spite of all opposition. Handing me the following letter, they took their seats in silence:

"FORT PLATTE, July 1, 1842.

"MR. FREMONT: Les chefs s'étant assemblés présentement me disent de vous avertir de ne point vous mettre en route, avant que le parti de jeunes gens qui est en dehors, soient de retour. Deplus ils me disent qu'ils sont très certain qu'ils feront feu, à la première rencontre. Ils doivent être de retour dans sept à huit jours; excusez si je vous fais ces observations, mais il me semble qu'il est mon devoir de vous avertir du danger. Même de plus, les chefs sont les porteurs de ce billet, qui vous defendent de partir avant le retour des guerriers.

Je suis votre ob't serv't'r,

"JOSEPH BISSONETTE,

"Par L. B. CHARTRAIN."

Les noms de quelques chefs :
Le Chapeau de Loure, le Casseur de Flèches, la Nuit Noir, La Queue
de Bœuf.

[Translation.]

"FORT PLATTE, July 1, 1842.

"MR. FREMONT: The chiefs having assembled in council, have just told me to warn you not to set out before the party of young men which is now out shall have returned. Furthermore, they tell me that they are very sure they will fire upon you as soon as they meet you. They are expected back in seven or eight days; excuse me for making these observations, but it seems my duty to warn you of danger. Moreover, the chiefs who prohibit your setting out before the return of the warriors, are the bearers of this note.

"I am your obedient servant,

"JOSEPH BISSONETTE,

"By L. B. CHARTRAIN.

"Names of some of the chiefs:

"The Otter Hat, the Breaker of Arrows, the Black Night, the Bull's Tail."

After reading this, I mentioned its purport to my companions, and seeing that all were fully possessed of its contents, one of the Indians rose up and having first shaken hands with me, spoke as follows:

"You have come among us at a bad time. Some of our people have been killed, and our young men, who are gone to the mountains, are eager to avenge the blood of their relations, which has been shed by the whites. Our young men are bad, and if they meet you they will believe that you are carrying goods and ammunition to their enemies, and will fire upon you. You have told us that this will make war. We know that our great father has many soldiers and big guns, and we are anxious to have our lives. We love the whites, and are desirous of peace. Thinking of all these things, we have determined to keep you here until our warriors return. We are glad to see you among us. Our father is rich, and we expected that you would have brought presents to us—horses, and guns, and blankets. But we are glad to see you. We look upon your coming as the light which goes before the sun; for you will tell our great father that you have seen us, and that we are naked and poor, and have nothing to eat, and he will send us all these things." He was followed by the others to the same effect.

The observations of the savage appeared reasonable; but I was aware that they had in view only the present object of detaining me, and were unwilling I should go further into the country. In reply, I asked them, through the interpretation of Mr. Boudeau, to select two or three of their number to accompany us until we should meet their people—they should spread their robes in my tent and eat at my table, and on our return would give them presents in reward of their services. They declined, saying that there were no young men left in the village, and that they were too old to travel so many days on horseback, and preferred now to smoke their pipes in the lodge, and let the warriors go on the war-path. Besides, they had no power over the young men, and were afraid to interfere with

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them. In my turn I addressed them: "You say that you love the whites; why have you killed so many already this spring? You say that you love the whites, and are full of many expressions of friendship to us, but you are not willing to undergo the fatigue of a few days' ride to save our lives. We do not believe what you have said, and will not listen to you. Whatever a chief among us tells his soldiers to do, is done. We are the soldiers of the great chief, your father. He has told us to come here and see this country, and all the Indians, his children. Why should we not go? Before we came, we heard that you had killed his people, and ceased to be his children; but we came among you peaceably, holding out our hands. Now we find that the stories we heard are not lies, and that you are no longer his friends and children. We have thrown away our bodies, and will not turn back. When you told us that your young men would kill us, you did not know that our hearts were strong, and you did not see the rifles which my young men carry in their hands. We are few, and you are many, and may kill us all; but there will be much crying in your villages, for many of your young men will stay behind, and forget to return with your warriors from the mountains. Do you think that our great chief will let his soldiers die, and forget to cover their graves? Before the snows melt again, his warriors will sweep away your villages as the fire does the prairie in the autumn. See! I have pulled down my *white houses*, and my people are ready: when the sun is ten paces higher, we shall be on the march. If you have anything to tell us, you will say it soon." I broke up the conference, as I could do nothing with these people, and being resolved to proceed, nothing was to be gained by delay. Accompanied by our hospitable friends, we returned to the camp. We had mounted our horses, and our parting salutations had been exchanged, when one of the chiefs, the Bull's Tail, arrived to tell me that they had determined to send a young man with us; and if I would point out the place of our evening camp, he should join us there. "The young man is poor," said he, "he has no horse, and expects you to give him one." I described him the place where I intended to encamp, and shaking hands, in a few minutes we were among the hills, and this last habitation of whites shut out from our view.

The road led over an interesting plateau between the north fork of the Platte on the right and Laramie river on the left. At the distance of ten miles from the fort we entered the sandy bed of a creek, a kind of defile, bounded by precipitous rocks, down which we wound our way for several hundred yards to a place where, on the left bank, a very large spring gushes with considerable noise and force out of the limestone rock. It is called the Warm Spring, and furnishes to the hitherto dry bed of the creek a considerable rivulet. On the opposite side, a little below the spring, is a lofty limestone escarpment, partially shaded by a grove of large trees, whose green foliage, in contrast with the whiteness of the rock, renders this a picturesque locality. The rock is fossiliferous, and, so far as I was able to determine the character of the fossils, belongs to the carboniferous limestone of the Missouri river, and is probably the western limit of that formation. Beyond this point I met with no fossils of any description.

I was desirous to visit the Platte near the point where it leaves the Black Hills, and therefore followed this stream, for two or three miles, to the mouth; here I encamped on a spot which afforded good grass and *prêle* (equisetum) for our animals. Our tents having been found too thin to protect

ourselves and the instruments from the rains, which in this elevated country are attended with cold and unpleasant weather, I had procured from the Indians at Laramie a tolerably large lodge, about eighteen feet in diameter and twenty feet in height. Such a lodge, when properly pitched, from its conical form, almost perfectly secure against the violent winds which are frequent in this region, and with a fire in the centre is a dry and warm shelter in bad weather. By raising the lower part so as to permit the breeze to pass freely, it is converted into a pleasant summer residence with the extraordinary advantage of being entirely free from mosquitoes, one of which I have never seen in an Indian lodge. While we were engaged very unskillfully in erecting this, the interpreter, Mr. Bissonette arrived, accompanied by the Indian and his wife. She laughed at our awkwardness, and offered her assistance, of which we were frequently afterward obliged to avail ourselves, before the men acquired sufficient expertness to pitch it without difficulty. From this place we had a fine view of the gorge where the Platte issues from the Black Hills, changing its character abruptly from a mountain stream into a river of the plains. Immediately around us the valley of the stream was tolerably open, and the distance of a few miles, where the river had cut its way through the hills, was the narrow cleft, on one side of which a lofty precipice of bright red rock rose vertically above the low hills which lay between us.

July 22.—In the morning, while breakfast was being prepared, I visited this place with my favorite man, Basil Lajeunesse. Entering so far as the river was footing for the mules, we dismounted, and, tying our animals, continued our way on foot. Like the whole country, the scenery of the river had undergone an entire change, and was in this place the most beautiful I have ever seen. The breadth of the stream, generally near that of the valley, was from two to three hundred feet, with a swift current, occasionally broken by rapids, and the water perfectly clear. On either side of the red precipices, vertical, and sometimes overhanging, two and four hundred feet in height, crowned with green summits, on which were scattered a few pines. At the foot of the rocks was the usual detritus, formed by masses fallen from above. Among the pines that grew here and on the occasional banks were the cherry, (*cerasus virginiana*) currants, and grape de bœuf (*shepherdia argentea*.) Viewed in the sunshine of a pleasant morning, the scenery was of a most striking and romantic beauty, which arose from the picturesque disposition of the objects and the vivid contrast of colors. I thought with much pleasure of our approaching descent in the canoe through such interesting places; and, in the expectation of being able at that time to give to them a full examination, did not now dwell so much on the might have been desirable upon the geological formations along the line of the river, where they are developed with great clearness. The upper portion of the red strata consists of very compact clay, in which are occasionally seen imbedded large pebbles. Below was a stratum of compact red sandstone, changing a little above the river into a very hard siliceous limestone. There is a small but handsome open prairie immediately below this place, on the left bank of the river, which would be a good locality for a military post. There are some open groves of cottonwood on the Platte. The small stream which comes in at this place is well timbered with pine, and good building rock is abundant.

If it is in contemplation to keep open the communications with Oregon Territory, a show of military force in this country is absolutely necessary

in this elevated corner had procured from the Missouri by excellent roads, which are in frequent use, and would not in any way interfere with the range of the buffalo, on which the neighboring Indians mainly depend for support. It would render any posts on the Lower Platte unnecessary; the ordinary communication between it and the Missouri being sufficient to control the intermediate Indians. It would operate effectually to prevent any such coalitions as are now formed among the Gros Ventres, Sioux, Cheyenne, and other Indians, and would keep the Oregon road through the valley of the Sweet Water and the South Pass of the mountains constantly open. A glance at the map which accompanies this report, will show that it lies at the foot of a broken and mountainous region, along which, by the establishment of small posts, in the neighborhood of St. Vrain's fort, on the South fork of the Platte, and Bent's fort, on the Arkansas, a line of communication would be formed, by good wagon roads, with our southern military posts, which could entirely command the mountain passes, hold some of the most troublesome tribes in check, and protect and facilitate our intercourse with the neighboring Spanish settlements. The valleys of the rivers on which they would be situated are fertile; the country which supports immense herds of buffalo is admirably adapted to grazing, and herds of cattle might be maintained by the posts, or obtained from the Spanish country, which already supplies a portion of their provisions to the trading posts mentioned above.

Just as we were leaving the camp this morning our Indian came up, and stated his intention of not proceeding any further until he had seen the horse which I intended to give him. I felt strongly tempted to drive him out of the camp, but his presence appeared to give confidence to my men, and the interpreter thought it absolutely necessary. I was, therefore, obliged to do what he requested, and pointed out the animal, with which I seemed satisfied, and we continued our journey. I had imagined that Mr. Bissonette's long residence had made him acquainted with the country, and, according to his advice, proceeded directly forward without attempting to regain the usual road. He afterward informed me that he had never lost sight of the fort; but the effect of the mistake was to involve us for a day or two among the hills, where, although we lost no time, we encountered an exceedingly rough road.

To the south, along our line of march to-day, the main chain of the Black or Laramie Hills rises precipitous. Time did not permit me to visit them, but, from comparative information, the ridge is composed of the coarse sandstone or conglomerate hereafter described. It appears to enter the region of clouds, which are arrested in their course and lie in masses along the summits. An inverted cone of black cloud (cumulus) rested during all the forenoon on the lofty peak of Laramie Mountain, which I estimated to be about two thousand feet above the fort, or six thousand five hundred above the sea. We halted to noon on the *Pourche Amère*, so called from being timbered principally with the *liard amère* (a species of poplar), with which the valley of the little stream is tolerably well wooded, and which, with large expansive summits, grows to the height of sixty or seventy feet. The bed of the creek is sand and gravel, the water dispersed over the hard bed in several shallow streams. We found here, on the right bank,

tations with Oregon absolutely necessary.

in the shade of the trees, a fine spring of very cold water. It will be remarked that I do not mention, in this portion of the journey, the temperature of the air, sand, springs, &c., an omission which will be explained in the course of the narrative. In my search for plants, I was well rewarded at this place.

With the change in the geological formation, on leaving Fort Laramie the whole face of the country has entirely altered its appearance. Eastward of that meridian, the principal objects which strike the eye of a traveller are the absence of timber, and the immense expanse of prairie, covered with the verdure of rich grasses, and highly adapted for pasturage. Wherever they are not disturbed by the vicinity of man, large herds of buffalo give animation to this country. Westward of Laramie river, the region is sandy and apparently sterile; and the place of the grass is usurped by the *artemisia* and other odoriferous plants, to whose growth the sandy soil and dry air of this elevated region seem highly favorable.

One of the prominent characteristics in the face of the country is the extraordinary abundance of the *artemisia*s. They grow everywhere; on the hills, and over the river bottoms, in tough, twisted, wirey clumps; and wherever the beaten track was left, they rendered the progress of the carter rough and slow. As the country increased in elevation on our advance to the west, they increased in size; and the whole air is strongly impregnated and saturated with the odor of camphor and spirits of turpentine which belongs to this plant. This climate has been found very favorable to the respiration of health, particularly in cases of consumption; and possibly the respiration of air, so highly impregnated by aromatic plants, may have some influence.

Our dried meat had given out, and we began to be in want of food; but one of the hunters killed an antelope this evening, which afforded some relief, although it did not go far among so many hungry men. At 8 o'clock at night, after a march of twenty-seven miles, we reached our proposed campment on the *Fer à Cheval*, or Horse Shoe creek. Here we found good grass, with a great quantity of *prêle*, which furnished good food for our tire animals. This creek is well timbered, principally with *liard amère*, and with the exception of Deer creek, which we had not yet reached, is the largest affluent of the right bank between Laramie and the mouth of the Sweet Water.

July 23.—The present year had been one of unparalleled drought, and throughout the country the water had been almost dried up. By availing themselves of the annual rise, the traders had invariably succeeded in carrying their furs to the Missouri; but this season, as has already been mentioned, on both forks of the Platte they had entirely failed. The greater number of the springs and many of the streams which made halting places for the *voyageurs*, had been dried up. Every where the soil looked parched and burnt, the scanty yellow grass crisped under the foot, and even the hardiest plants were destroyed by want of moisture. I think it necessary to mention this fact, because to the rapid evaporation in such an elevated region nearly 5,000 feet above the sea, almost wholly unprotected by timber, should be attributed much of the sterile appearance of the country, in the destruction of vegetation, and the numerous saline efflorescences which covered the ground. Such I afterward found to be the case.

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and now it was after great search that we were able to find a scanty patch of grass, sufficient to keep them from sinking, and in the course of a day or two they began to suffer very much. We found none to-day at noon; and, in the course of our search on the Platte, came to a grove of cottonwood where some Indian village had recently encamped. Boughs of the cottonwood yet green covered the ground, which the Indians had cut down to feed their horses upon. It is only in the winter that recourse is had to this means of sustaining them; and their resort to it at this time was a striking evidence of the state of the country. We followed their example, and turned our horses into a grove of young poplars. This began to present itself as a very serious evil, for on our animals depended altogether the further prosecution of our journey.

Shortly after we had left this place, the scouts came galloping in with the alarm of Indians. We turned in immediately towards the river, which here had a steep high bank, where we formed with the carts a very close barriade, resting on the river, within which the animals were strongly hobbled and picketed. The guns were discharged and reloaded, and men thrown forward, under cover of the bank, in the direction by which the Indians were expected. Our interpreter, who, with the Indian, had gone to meet them, came in in about ten minutes, accompanied by two Sioux. They looked sulky, and we could obtain from them only some confused information. We learned that they belonged to the party which had been on the trail of the emigrants, whom they had overtaken at Rock Independence, on the Sweet Water. Here the party had disagreed, and came nigh fighting among themselves. One portion were desirous of attacking the whites, but the others were opposed to it; and finally they had broken up into small bands and dispersed over the country. The greater portion of them had gone over into the territory of the Crows, and intended to return by way of the Wind River valley, in the hope of being able to fall upon some small parties of Crow Indians. The remainder were returning down the Platte in scattered parties of ten and twenty, and those whom we had encountered belonged to those who had advocated an attack on the emigrants. Several of the men suggested shooting them on the spot; but I promptly discountenanced any such proceeding. They further informed me that buffalo were very scarce, and little or no grass to be found. There had been no rain, and innumerable quantities of grasshoppers had destroyed the grass. This insect had been so numerous since leaving Fort Laramie, that the ground seemed alive with them; and in walking, a little moving cloud preceded our footsteps. This was bad news. No grass, no buffalo—no food for neither horse nor man. I gave them some plugs of tobacco and they went off, apparently well satisfied to be clear of us; for my men did not look upon them very lovingly, and they glanced suspiciously at our warlike preparations, and the little ring of rifles which surrounded them. They were evidently in a bad humor, and shot one of their horses when they had left us a short distance.

We continued our march, and after a journey of about twenty-one miles, encamped on the Platte. During the day, I had occasionally remarked among the hills the *psoralea esculenta*, the bread root of the Indians. The Sioux use this root very extensively, and I have frequently met with it among them, cut into thin slices and dried. In the course of the evening we were visited by six Indians, who told us that a larger party was en-

camped a few miles above. Astronomical observations placed us in longitude $106^{\circ} 03' 40''$, and latitude $42^{\circ} 39' 25''$.

We made the next day twenty-two miles, and encamped on the right bank of the Platte, where a handsome meadow afforded tolerably good grass. There were the remains of an old fort here, thrown up in some sudden emergency, and on the opposite side was a picturesque bluff of ferruginous sandstone. There was a handsome grove a little above, and scattered groups of trees bordered the river. Buffalo made their appearance this afternoon, and the hunters came in shortly after we had encamped, with three fine cows. The night was fine, and observations gave for the latitude of the camp, $42^{\circ} 47' 40''$.

July 25.—We made but thirteen miles this day, and encamped about noon in a pleasant grove on the right bank. Low scaffolds were erected, upon which the meat was laid, cut up into thin strips, and small fires kindled below. Our object was to profit by the vicinity of the buffalo, to lay in a stock of provisions for ten or fifteen days. In the course of the afternoon, the hunters brought in five or six cows, and all hands were kept busily employed in preparing the meat, to the drying of which the guard attended during the night. Our people had recovered their gaiety, and the busy figures around the blazing fires gave a picturesque air to the camp. A very serious accident occurred this morning, in the breaking of one of the barometers. These had been the object of my constant solicitude, and, as I had intended them principally for mountain service, I had used them as seldom as possible; taking them always down at night, and on the occurrence of storms, in order to lessen the chances of being broken. I was reduced to one, a standard barometer, of Troughton's construction. This I determined to preserve, if possible. The latitude is $42^{\circ} 51' 35''$, and by a mean of the results from chronometer, and lunar distances, the adopted longitude of this camp is $106^{\circ} 25' 10''$.

July 26.—Early this morning we were again in motion. We had a stock of provisions for fifteen days, carefully stored away in the carts, and this I resolved should only be encroached upon when our rifles should fail to procure us present support. I determined to reach the mountains, if it were in any way possible. In the meantime buffalo were plenty. In six miles from our encampment, which, by way of distinction, we shall call Dried Meat camp, we crossed a handsome stream, called *La Fourche Boisée*. It is well timbered, and among the flowers in bloom on its banks, I remarked several *asters*.

Five miles further we made our noon halt, on the banks of the Platte, in the shade of some cottonwoods. There were here, as generally now along the river, thickets of *hippophae*, the *grains de bœuf* of the country. They were of two kinds; one bearing a red berry, (the *shepherdia argentea* of Nuttall;) the other a yellow berry, of which the Tartars are said to make a kind of rob.

By a meridian observation, the latitude of the place was, $42^{\circ} 50' 08''$. It was my daily practice to take observations of the sun's meridian altitude, and why they are not given, will appear in the sequel. Eight miles further we reached the mouth of Deer creek, where we encamped. Here was an abundance of rich grass, and our animals were compensated for past privations. This stream was at this time twenty feet broad, and well timbered with cottonwood of an uncommon size. It is the largest tributary of the Platte between the mouth of the Sweet Water and the Laramie. Our as-

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July 27.—Nothing worthy of mention occurred on this day; we travelled later than usual, having spent some time in searching for grass, crossing and recrossing the river before we could find a sufficient quantity for our animals. Toward dusk, we encamped among some artemisia bushes, two and three feet in height, where some scattered patches of short tough grass afforded a scanty supply. In crossing, we had occasion to observe, that the river was frequently too deep to be forded, though we always succeeded in finding a place where the water did not enter the carts. The stream continued very clear, with two or three hundred feet breadth of water, and the sandy bed and banks were frequently covered with large round pebbles. We had travelled this day twenty-seven miles. The main chain of the Black Hills were here only about seven miles to the south, on the right bank of the river, rising abruptly to the height of eight and twelve hundred feet. Patches of green grass in the ravines on the steep sides, marked the presence of springs, and the summits were clad with pines.

July 28.—In two miles from our encampment we reached the place where the regular road crosses the Platte. There was two hundred feet breadth of water at this time in the bed, which has a variable width of eight to fifteen hundred feet. The channels were generally three feet deep, and there were large angular rocks on the bottom, which made the ford in some places a little difficult. Even at its low stages this river can not be crossed at random, and this has always been used as the best ford. The low stage of the waters the present year had made it fordable in almost any part of its course, where access could be had to its bed.

For the satisfaction of travellers, I will endeavor to give some description of the nature of the road from Laramie to this point. The nature of the soil may be inferred from its geological formation. The limestone at the eastern limit of this section, is succeeded by limestone without fossils, a great variety of sandstone, consisting principally of red sandstone and fine conglomerates. The red sandstone is argillaceous, with compact white gypsum or alabaster, very beautiful. The other sandstones are gray, yellow, and ferruginous, sometimes very coarse. The apparent sterility of the country must therefore be sought for in other causes than the nature of the soil. The face of the country can not with propriety be called hilly. It is a succession of long ridges, made by the numerous streams which come down from the neighboring mountain range. The ridges have an undulating surface, with some such appearance as the ocean presents in an ordinary breeze.

The road which is now generally followed through this region is, therefore, a very good one, without any difficult ascents to overcome. The principal obstructions are near the river, where the transient waters of heavy rains have made deep ravines with steep banks, which renders frequent circuits necessary. It will be remembered that wagons pass this road only once or twice a year, which is by no means sufficient to break down the stubborn roots of the innumerable artemisia bushes. A partial absence of these is often the only indication of the track, and the roughness produced by their roots in many places gives the road the character of one newly opened in a wooded country. This is usually considered the worst part of the road east of the mountains, and as it passes through an open prairie region

may be much improved, so as to avoid the greater part of the inequalities it now presents.

From the mouth of the Kansas to the Green river valley, west of the Rocky Mountains, there is no such thing as a mountain road on the line of communication.

We continued our way, and four miles beyond the ford, Indians were discovered again, and I halted while a party were sent forward to ascertain who they were. In a short time they returned, accompanied by a number of Indians of the Oglallah band of Sioux. From them we received some interesting information: They had formed part of the great village, which they informed us had broken up, and was on its way home. The greater part of the village, including the Arapahoes, Cheyennes, and Oglallahs had crossed the Platte eight or ten miles below the mouth of the Sweet Water, and were now behind the mountains to the south of us, intending to regain the Platte by way of Deer creek. They had taken this unusual route in search of grass and game. They gave us a very discouraging picture of the country. The great drought, and the plague of grasshoppers, had swept it so, that scarce a blade of grass was to be seen, and there was not a buffalo to be found in the whole region. Their people, they further said, had been nearly starved to death, and we would find the road marked by lodges which they had thrown away in order to move more rapidly, and by the carcasses of the horses which they had eaten, of which had perished by starvation. Such was the prospect before us.

When he had finished the interpretation of these things, Mr. Bissonette immediately rode up to me and urgently advised that I should entirely abandon the further prosecution of my exploration. "*Le meilleur avis que je pourrais vous donner, c'est de virer de suite.*" "The best advice I can give you, is to turn back at once." It was his own intention to return, as we had now reached the point to which he had engaged to attend me. In reply, I called up my men and communicated to them fully the information I had just received. I then expressed to them my fixed determination to proceed to the end of the enterprise on which I had been sent, but as the situation of the country gave me some reason to apprehend that it might be attended with an unfortunate result to some of us, I would leave it optional with them to continue with me or to return.

Among them were some five or six who I knew would remain. We had still ten day's provisions; and, should no game be found, when the stock was expended, we had our horses and mules, which we could eat when other means of subsistence failed. But not a man flinched from the undertaking. "We'll eat the mules," said Basil Lajennesse; and thereupon we shook hands with our interpreter and his Indians, and parted. With them I sent back one of my men, Dumés, whom the effects of an old wound in the leg rendered incapable of continuing the journey on foot, and his horse seemed on the point of giving out. Having resolved to disencumber ourselves immediately of every thing not absolutely necessary to our future operations, I turned directly in towards the river, and encamped on the left bank, a little above the place where our council had been held, and where a thick grove of willows offered a suitable spot for the object had in view.

The cars having been discharged, the covers and wheels were taken off and, with the frames, carried into some low places among the willows, and concealed in the dense foliage in such a manner that the glitter of the iron

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work might not attract the observation of some straggling Indian. In the sand which had been blown up into waves among the willows, a large hole was then dug, ten feet square and six deep. In the meantime, all our effects had been spread out upon the ground, and whatever was designed to be carried along with us separated and laid aside, and the remaining part carried to the hole and carefully covered up. As much as possible all traces of our proceedings were obliterated, and it wanted but a rain to render our *cache* safe beyond discovery. All the men were now set at work to arrange the pack-saddles and make up the packs.

The day was very warm and calm, and the sky entirely clear, except where, as usual along the summits of the mountainous ridge opposite, the clouds had congregated in masses. Our lodge had been planted, and, on account of the heat, the ground-pins had been taken out, and the lower part slightly raised. Near to it was standing the barometer, which swung on a tripod frame; and within the lodge, where a small fire had been built, Mr. Preuss was occupied in observing the temperature of boiling water. At this instant, and without any warning, until it was within fifty yards, a violent gust of wind dashed down the lodge, burying under it Mr. Preuss and about a dozen men, who had attempted to keep it from being carried away. I succeeded in saving the barometer, which the lodge was carrying off with itself, but the thermometer was broken. We had no others of a high graduation, none of those which remained going higher than 135° Fahrenheit. Our astronomical observations gave to this place, which we named *Cache camp*, a longitude of 107° 15' 55", latitude 42° 50' 53".

July 29.—All our arrangements having been completed, we left the encampment at 7 o'clock this morning. In this vicinity the ordinary road leaves the Platte, and crosses over to the Sweet Water river, which it strikes near Rock Independence. Instead of following this road, I had determined to keep the immediate valley of the Platte so far as the mouth of the Sweet Water, in the expectation of finding better grass. To this I was further prompted by the nature of my instructions. To Mr. Carson was assigned the office of guide, as we had now reached a part of the country with which, or a great part of which, long residence had made him familiar. In a few miles we reached the Red Buttes, a famous landmark in this country, whose geological composition is red sandstone, limestone, and calcareous sandstone, and puddingstone.

The river here cuts its way through a ridge; on the eastern side of it are the lofty escarpments of red argillaceous sandstone, which are called the Red Buttes. In this passage the stream is not much compressed or bent up, there being a bank of considerable though variable breadth on either side. Immediately on entering we discovered a band of buffalo. The hunters failed to kill any of them, the leading hunter being thrown to a ravine, which occasioned some delay, and in the meantime the herd ambled up the steep face of the ridge. It is sometimes wonderful to see these apparently clumsy animals make their way up and down the most jagged and broken precipices. We halted to noon before we had cleared this passage at a spot twelve miles distant from *Cache camp*, where we found an abundance of grass. So far the account of the Indians was found to be false. On the banks were willow and cherry trees. The cherries were not yet ripe, but in the thickets were numerous fresh tracks of the rizzly bear, which are very fond of this fruit. The soil here is red, the composition being derived from the red sandstone. About seven miles brought

us through the ridge, in which the course of the river is north and south. Here the valley opens out broadly, and high walls of the red formation present themselves among the hills to the east. We crossed here a pretty little creek, an affluent of the right bank. It is well timbered with cottonwood in this vicinity, and the abutments have lost their shrubby character, and become small trees six and eight feet in height, and sometimes eight inches in diameter. Two or three miles above this creek we made our encampment, having travelled to-day twenty-five miles. Our animals fared well here, as there is an abundance of grass. The river bed is made up of pebbles, and in the bank at the level of the water is a conglomerate of coarse pebbles about the size of ostrich eggs, and which I remarked in the bank of the Laramie fork. It is overlaid by a soil of mixed clay and sand a few feet thick. By astronomical observations our position is in longitude $109^{\circ} 29' 08''$, and latitude $42^{\circ} 38'$.

July 30.—After travelling about twelve miles this morning, we reached a place where the Indian village had crossed the river. Here were the poles of discarded lodges and skeletons of horses lying about. Mr. Carson, who had never been higher up than this point on the river, which has the character of being exceedingly rugged and walled in by precipices above, thought it advisable to camp near this place, where we were certain of obtaining grass, and to-morrow make our crossing among the rugged hills to the Sweetwater river. Accordingly we turned back and descended the river to a small island near by, which was about twenty acres in size, covered with a luxuriant growth of grass. The formation here I found highly interesting. Immediately at this island the river is again shut up in the rugged hills, which come down to it from the main ridge in a succession of spurs three or four hundred feet high, and alternated with green level *prairillons* or meadows bordered on the river banks with thickets of willow, and having many places to interest the traveller. The island lies between two of these ridges, three or four hundred yards apart, of which that on the right bank is composed entirely of red argillaceous sandstone, with thin layers of fibrous gypsum. On the left bank, the ridge is composed entirely of siliceous puddingstone, the pebbles in the numerous strata increasing in size from the top to the bottom, where they are as large as a man's head. So far as I was able to determine, these strata incline to the northeast, with a dip of about 15° . This puddingstone or conglomerate formation I was enabled to trace through an extended range of country, from a few miles east of the meridian of Fort Laramie to where I found it superposed on the granite of the Rocky Mountains, in longitude $109^{\circ} 30'$. From its appearance, the main chain of the Laramie mountain is composed of this rock; and in a number of places I found isolated hills, which served to mark a former level, which had been probably swept away.

These conglomerates are very friable and easily decomposed; and I am inclined to think this formation is the source from which was derived the great deposits of sand and gravel which forms the surface rock of the prairie country west of the Mississippi.

Crossing the ridge of red sandstone, and traversing the little prairie which lies to the southward of it, we made in the afternoon an excursion to a place which we have called the Hot Spring Gate. This place has much the appearance of a gate, by which the Platte passes through a ridge composed of white and calcareous sandstone. The length of the passage is about a hundred yards, with a smooth green prairie on either side. Through

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place, the stream flows with a quiet current, unbroken by any rapid, and is about seventy yards wide between the walls, which rise perpendicularly from the water. To that on the right bank, which is the lower, the barometer gave a height of three hundred and sixty feet. Annexed is a view of this place, which will be more particularly described hereafter, as we passed through it on our return.

We saw here numerous herds of mountain sheep, and frequently heard the volley of rattling stones which accompanied their rapid descent down the steep hills. This was the first place at which we had killed any of these animals; and, in consequence of this circumstance, and of the abundance of these sheep or goats (for they are called by each name), we gave to our encampment by the name of Goat Island. Their flesh is much esteemed by the hunters, and has very much the flavor of the Alleghany Mountain sheep. I have frequently seen the horns of this animal three feet long and seventeen inches in circumference at the base, weighing eleven pounds. But two or three of these were killed by our party at this place, and of these the horns were small. The use of these horns seem to be to protect the animal's head, in pitching down precipices to avoid pursuing wolves—their only safety being in places where they can not be followed. The bones are very strong and solid, the marrow occupying but a very small portion of the bone in the leg, about the thickness of a rye straw. The hair is short, resembling the winter color of our common deer, which it nearly approaches in size and appearance. Except in the horns, it has no resemblance whatever to the goat. The longitude of this place, resulting from chronometer and lunar distances, and an occultation of α Arietis is $107^{\circ} 37' 27''$, and the latitude $42^{\circ} 33' 27''$. One of our horses, which had given out, we left to receive strength on the island, intending to take her, perhaps, on our return.

July 31.—This morning we left the course of the Platte to cross over to the Sweet Water. Our way for a few miles lay up the sandy bed of a dry creek, in which I found several interesting plants. Leaving this we wound our way to the summit of the hills, of which the peaks are here eight hundred feet above the Platte, bare and rocky. A long and gradual slope led from these hills to the Sweet Water, which we reached in fifteen miles from Goat Island. I made an early encampment here, in order to give the hunters an opportunity to procure a supply from several bands of buffalo, which made their appearance in the valley near by. The stream here is about sixty feet wide, and at this time twelve to eighteen inches deep, with a very moderate current.

The adjoining prairies are sandy; but the immediate river bottom is a good soil, which afforded an abundance of soft green grass to our horses, and where I found a variety of interesting plants, which made their appearance for the first time. A rain to-night made it unpleasantly cold; and there was no tree here to enable us to pitch our single tent, the poles of which had been left at *Cache camp*. We had, therefore, no shelter except what was to be found the cover of the *absinthe* bushes, which grew in many thick patches, one or two and sometimes three feet high.

August 1.—The hunters went ahead this morning, as buffalo appeared tolerably abundant, and I was desirous to secure a small stock of provisions, and we moved about seven miles up the valley, and encamped one mile below Rock Independence. This is an isolated granite rock, about six hundred and fifty yards long, and forty in height. Except in a depression of the summit, where a little soil supports a scanty growth of shrubs, with a

solitary dwarf pine, it is entirely bare. Everywhere within six or eight feet of the ground, where the surface is sufficiently smooth, and in some places sixty or eighty feet above, the rock is inscribed with the names of travellers. Many a name famous in the history of this country, and some well-known to science, are to be found mixed among those of the traders and of travellers for pleasure and curiosity, and of missionaries among the savages. Some of these have been washed away by the rain, but the greater number are still very legible. The position of this rock is in longitude $107^{\circ} 56'$, latitude $42^{\circ} 29' 36''$. We remained at our camp of August 1st until noon of the next day, occupied in drying meat. By observation, the longitude of the place is $107^{\circ} 55'$, latitude $42^{\circ} 29' 56''$.

August 2.—Five miles above Rock Independence we came to a place called the Devil's Gate, where the Sweet Water cuts through the point of a granite ridge. The length of the passage is about three hundred yards, and the width thirty-five yards. The walls of rock are vertical, and about four hundred feet in height; and the stream in the gate is almost entirely choked up by musses which have fallen from above. In the wall, on the right bank, is a dyke of trap rock, cutting through a fine-grained gray granite. Near the point of this ridge crop out some strata of the valley formation, consisting of grayish micaceous sandstone, and fine-grained conglomerate, and ma . . . We encamped eight miles above the Devil's Gate, of which a view is given in the annexed plate. There was no timber of any kind on the river, but good fires were made of drift wood, aided by the *bois de vache*.

We had to-night no shelter from the rain, which commenced with squalls of wind about sunset. The country here is exceedingly picturesque. On either side of the valley, which is four or five miles broad, the mountains rise to the height of twelve and fifteen hundred, or two thousand feet. On the south side, the range appears to be timbered, and to-night is luminous with fires, probably the work of the Indians, who have just passed through the valley. On the north, broken and granite masses rise abruptly from the green sward of the river, terminating in a line of broken summits. Except in the crevices of the rock, and here and there on a ledge or bench of the mountain, where a few hardy pines have clustered together, these are perfectly bare and destitute of vegetation.

Among these masses, where there are sometimes isolated hills and ridges, green valleys open in upon the river, which sweeps the base of these mountains for thirty-six miles. Everywhere its deep verdure and profusion of beautiful flowers is in pleasing contrast with the sterile grandeur of the rock, and the barrenness of the sandy plain, which, from the right bank of the river sweeps up to the mountain range that forms its southern boundary. The great evaporation on the sandy soil of this elevated plain, and the saline efflorescences which whiten the ground, and shine like lakes reflecting the sun, make a soil wholly unfit for cultivation.

August 3.—We were early on the road the next morning, travelling along the upland part of the valley, which is overgrown with *artemisia*. Scattered about on the plain are occasional small isolated hills. One of these which I examined, about fifty feet high, consisted of white clay and marl, in nearly horizontal strata. Several bands of buffalo made their appearance to-day, with herds of antelope; and a grizzly bear—the only one we encountered during the journey—was seen scrambling up among the rocks. As we passed over a slight rise near the river, we caught the first view of the

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Wind River mountains, appearing at this distance of about seventy miles, to be a low and dark mountainous ridge. The view dissipated in a moment the pictures which had been created in our minds, by many descriptions of travellers, who have compared these mountains to the Alps in Switzerland; and speak of the glittering peaks which rise in icy majesty amidst the eternal glaciers nine or ten thousand feet into the region of eternal snows. The nakedness of the river was relieved by groves of willows, where we encamped at night, after a march of twenty-six miles; and numerous bright-colored flowers had made the river bottom look gay as a garden. We found here a horse, which had been abandoned by the Indians, because his hoofs had been so much worn that he was unable to travel; and during the night, a dog came into the camp.

August 4.—Our camp was at the foot of the Granite mountains, which we climbed this morning to take some barometrical heights; and here among the rocks was seen the first magpie. On our return we saw one at the mouth of the Platte river. We left here one of our horses, which was unable to proceed further. A few miles from the encampment we left the river, which makes a bend to the south, and traversing an undulating country, consisting of a grayish micaceous sandstone and fine-grained conglomerates, struck it again, and encamped after a journey of twenty-five miles. Astronomical observations placed us in latitude $42^{\circ} 32' 30''$.

August 5.—The morning was dark, with a driving rain, and disagreeably cold. We continued our route as usual, but the weather became so bad that we were glad to avail ourselves of the shelter offered by a small island, about ten miles above our last encampment, which was covered with a dense growth of willows. There was fine grass for our animals, and the timber afforded us comfortable protection and good fires. In the afternoon the sun broke through the clouds for a short time, and the barometer at 5 P. M., was at 23.713, the thermometer 60° , with the wind strong from the northwest. We availed ourselves of the fine weather to make excursions in the neighborhood. The river, at this place, is bordered by hills of the valley formation. They are of moderate height, one of the highest peaks on the right bank being, according to the barometer, one hundred and eighty feet above the river. On the left bank they are higher. They consist of a fine white clayey sandstone, a white calcareous sandstone, and coarse sandstone or pudding-stone.

August 6.—It continued steadily raining all the day; but, notwithstanding, we left our encampment in the afternoon. Our animals had been much refreshed by their repose, and an abundance of rich, soft grass, which had been much improved by the rains. In about three miles, we reached the entrance of a *kanyon*, where the Sweet Water issues upon the more open valley we had passed over. Immediately at the entrance, and superimposed directly upon the granite, are strata of compact, calcareous sandstone and chert, alternating with fine white and reddish white, and fine gray and red sandstones. These strata dip to the eastward at an angle of about 18° , and form the western limit of the sand and limestone formations, on the line of our route. Here we entered among the primitive rocks. The usual road passes to the right of this place, but we wound, or rather scrambled, our way up the narrow valley for several hours. Wilderness and disorder were the character of this scenery. The river had been swollen by the late rains, and came rushing through with an impetuous current, three or four feet deep, and generally twenty yards broad. The

valley was sometimes the breadth of the stream, and sometimes opened into little green meadows, sixty yards wide, with open groves of aspen. The stream was bordered throughout with aspen, beech, and willow; and tall pines grew on the sides and summits of the crags. On both sides, the granite rocks rose precipitously to the height of three hundred and five hundred feet, terminating in jagged and broken pointed peaks; and fragments of fallen rock lay piled up at the foot of the precipices. Gneiss, mica slate, and a white granite, were among the varieties I noticed. Here were many old traces of beaver on the stream, remnants of dams, near which were lying trees, which they had cut down, one and two feet in diameter. The hills entirely shut up the river at the end of about five miles, and we turned up a ravine that led to a high prairie, which seemed to be the general level of the country. Hence, to the summit of the ridge, there is a regular and very gradual rise. Blocks of granite were piled up at the heads of the ravines, and small bare knolls of mica slate and milky quartz protruded at frequent intervals on the prairie, which was whitened in occasional spots with small salt lakes where the water had evaporated, and left the bed covered with a shining incrustation of salt. The evening was very cold, a northwest wind driving a fine rain in our faces, and at nightfall we descended to a little stream on which we encamped, about two miles from the Sweet Water. Here had recently been a very large camp of Snake and Crow Indians, and some large poles lying about afforded the means of pitching a tent, and making other places of shelter. Our fires to-night were made principally of the dry branches of the artemisia, which covered the slopes. It burns quickly, with a clear oily flame, and makes a hot fire. The hills here are composed of hard, compact mica slate, with veins of quartz.

August 7.—We left our encampment with the rising sun. As we rose from the bed of the creek, the *snow* line of the mountains stretched grandly before us, the white peaks glittering in the sun. They had been hidden in the dark weather of the last few days, and it had been *snowing* on them, while it *rained* in the plains. We crossed a ridge, and again struck the Sweet Water; here, a beautiful swift stream, with a more open valley, timbered with beech and cottonwood. It now began to lose itself in the many small forks which make its head, and we continued up the main stream until near noon, when we left it a few miles to make our noon halt on a small creek among the hills, from which the stream issues by a small opening. Within was a beautiful grassy spot, covered with an open grove of large beech trees, among which I found several plants that I had not previously seen.

The afternoon was cloudy, with squalls of rain; but the weather became fine at sunset, when we again encamped on the Sweet Water, within a few miles of the *SOUTH PASS*. The country, over which we have passed to-day, consists principally of the compact mica slate, which crops out on all the ridges, making the uplands very rocky and slaty. In the escarpments which border the creeks, it is seen alternating with a light colored granite, at an inclination of 45° ; the beds varying in thickness from two or three feet to six or eight hundred. At a distance, the granite frequently has the appearance of irregular lumps of clay, hardened by exposure. A variety of *asters* may now be numbered among the characteristic plants, and the artemisia continues in full glory; but *cacti* have become rare, and mosses begin to dispute the hills with them. The evening was damp and

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unpleasant, the thermometer at 10 o'clock being at 36° , and the grass wet with a heavy dew. Our astronomical observations placed this encampment in longitude $109^{\circ} 51' 29''$, and latitude $42^{\circ} 27' 15''$.

Early in the morning we resumed our journey, the weather still cloudy, with occasional rain. Our general course was west, as I had determined to cross the dividing ridge by a bridle path among the broken country more immediately at the foot of the mountains, and return by the wagon road two and a half miles to the south of the point where the trail crosses.

About six miles from our encampment brought us to the summit. The ascent had been so gradual that, with all the intimate knowledge possessed by Carson, who had made this country his home for seventeen years, we were obliged to watch very closely to find the place at which we had reached the culminating point. This was between two low hills, rising on either hand fifty or sixty feet. When I looked back at them from the foot of the immediate slope on the western plain, their summit appeared to be about one hundred and twenty feet above. From the impression on my mind at this time, and subsequently on our return, I should compare the elevation which we surmounted immediately at the pass, to the ascent of the Capitol hill from the avenue, at Washington. It is difficult for me to fix positively the breadth of this pass. From the broken ground where it commences, at the foot of the Wind River chain, the view to the southeast is over a champaign country, broken, at the distance of nineteen miles, by the Table Rock; which, with the other isolated hills in its vicinity, seems to stand on a comparative plain. This I judged to be its termination, the ridge recovering its rugged character with the Table Rock. It will be seen that it in no manner resembles the places to which the term is commonly applied—nothing of the gorge-like character and winding ascents of the Alleghany passes in America, nothing of the Great St. Bernard and Simplon passes in Europe. Approaching it from the mouth of the Sweet Water, a sandy plain, one hundred and twenty miles long, conducts, by a gradual and regular ascent, to the summit, about seven thousand feet above the sea; and the traveller, without being reminded of any change by toilsome ascents, suddenly finds himself on the waters which flow to the Pacific ocean. By the route we had travelled, the distance from Fort Laramie is three hundred and twenty miles, or nine hundred and fifty from the mouth of the Kansas.

Continuing our march, we reached, in eight miles from the pass, the Little Sandy, one of the tributaries of the Colorado, or Green river of the Gulf of California. The weather had grown fine during the morning, and we remained here the rest of the day, to dry our baggage and take some astronomical observations. The stream was about forty feet wide, and two or three deep, with clear water and a full swift current, over a sandy bed. It was timbered with a growth of low, bushy and dense willows, among which were little verdant spots, which gave our animals fine grass, and where I found a number of interesting plants. Among the neighboring hills I noticed fragments of granite containing magnetic iron. Longitude of the camp was $110^{\circ} 07' 46''$, latitude $42^{\circ} 27' 34''$.

August 9.—We made our noon halt to-day on Big Sandy, another tributary of Green river. The face of the country traversed was of a brown sand of granite materials, the *detritus* of the neighboring mountains. Strata of the milky quartz cropped out, and blocks of granite were scattered about containing magnetic iron. On Sandy creek the formation was of parti-colored sand, exhibited in escarpments fifty to eighty feet high. In the

afternoon we had a severe storm of hail, and encamped at sunset on the first New Fork. Within the space of a few miles the Wind mountains supply a number of tributaries to Green river, which are all called the New Forks. Near our camp were two remarkable isolated hills, one of them sufficiently large to merit the name of mountain. They are called the Two Buttes, and will serve to identify the place of our encampment, which the observations of the evening placed in longitude $110^{\circ} 29' 17''$, and latitude $42^{\circ} 42' 46''$. On the right bank of the stream, opposite to the large hill, the strata which are displayed consist of decomposing granite, which supplies the brown sand of which the face of the country is composed to a considerable depth.

August 10.—The air at sunrise is clear and pure, and the morning extremely cold, but beautiful. A lofty snow peak of the mountain is glittering in the first rays of the sun, which has not yet reached us. The long mountain wall to the east rising two thousand feet abruptly from the plain, behind which we see the peaks, is still dark, and cuts clear against the glowing sky. A fog, just risen from the river, lies along the base of the mountain. A little before sunrise the thermometer was at 35° , and at sunrise 33° . Water froze last night, and fires are very comfortable. The scenery becomes hourly more interesting and grand, and the view here is truly magnificent; but, indeed, it needs something to repay the long prairie journey of a thousand miles. The sun has just shot above the wall, and makes a magical change. The whole valley is glowing and bright, and all the mountain peaks are gleaming like silver. Though these snow mountains are not the Alps, they have their own character of grandeur and magnificence, and will doubtless find pens and pencils to do them justice. In the scene before us we feel how much wood improves a view. The pines on the mountain seemed to give it much additional beauty. I was agreeably disappointed in the character of the streams on this side of the ridge. Instead of the creeks which description had led me to expect, I find bold broad streams, with three or four feet water and a rapid current. The fork on which we are encamped is upwards of a hundred feet wide, timbered with groves or thickets of the low willow. We were now approaching the loftiest part of the Wind River chain, and I left the valley a few miles from our encampment, intending to penetrate the mountains as far as possible with the whole party. We were soon involved in very broken ground, among long ridges covered with fragments of granite. Winding our way up a long ravine, we came unexpectedly in view of a most beautiful lake, set like a gem in the mountains. The sheet of water lay transversely across the direction we had been pursuing; and, descending the steep, rocky ridge, where it was necessary to lead our horses, we followed its banks to the southern extremity. Here a view of the utmost magnificence and grandeur burst upon our eyes. With nothing between us and their feet to lessen the effect of the whole height, a grand bed of snow-capped mountains rose before us, pile upon pile, glowing in the bright light of an August day. Immediately below them lay the lake between two ridges covered with dark pines, which swept down from the main chain to the spot where we stood. Here, where the lake glittered in the open sunlight, its banks of yellow sand and the light foliage of aspen groves contrasted well with the gloomy pines. "Never before," said Mr. Preuss, "in this country or in Europe, have I seen such magnificent, grand rocks." I was so much pleased with the beauty of the place that I determined to make

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the main camp here, where our animals would find good pasturage, and explore the mountains with a small party of men. Proceeding a little further, we came suddenly upon the outlet of the lake where it found its way through a narrow passage between low hills. Dark pines which overhung the stream and masses of rock where the water foamed along gave it much romantic beauty. Where we crossed, which was immediately at the outlet, it is two hundred and fifty feet wide, and so deep that with difficulty we were able to ford it. Its bed was an accumulation of rocks, boulders, and broad slabs, and large angular fragments, among which the animals fell repeatedly.

The current was very swift, and the water cold and of a crystal purity. In crossing this stream, I met with a great misfortune in having my barometer broken. It was the only one; a great part of the interest of the journey for me was in the exploration of these mountains, of which so much had been said that was doubtful and contradictory; and now their snowy peaks rose majestically before me, and the only means of giving them authentically to science, the object of my anxious solicitude by night and day, was destroyed. We had brought this barometer in safety a thousand miles, and broke it almost among the snow of the mountains. The loss was felt by the whole camp—all had seen my anxiety, and aided me in preserving it; the height of these mountains, considered by the hunters and traders the highest in the whole range, had been a theme of constant discussion among them; and all had looked forward with pleasure to the moment when the instrument, which they believed to be true as the sun, should stand upon the summits and decide their disputes. Their grief was only inferior to my own.

This lake is about three miles long, and of very irregular width, and apparently great depth, and is the head water of the third New Fork, a tributary to Green river, the Colorado of the West. On the map and in the narrative I have called it Mountain lake. I encamped on the north side, about three hundred and fifty yards from the outlet. This was the most western point at which I obtained astronomical observations, by which this place, called Bernier's encampment, is made in $110^{\circ} 37' 25''$ west longitude from Greenwich, and latitude $42^{\circ} 49' 49''$. The mountain peaks, as laid down, were fixed by bearings from this and other astronomical points. We had no other compass than the small ones used in sketching the country; but from an azimuth, in which one of them was used, the variation of the compass is 18° east. The correction made in our field work by the astronomical observations indicates that this is a very correct observation.

As soon as the camp was formed, I set about endeavoring to repair my barometer. As I have already said, this was a standard cistern-barometer, of Troughton's construction. The glass cistern had been broken about midway; but as the instrument had been kept in a proper position, no air had found its way into the tube, the end of which had always remained covered. I had with me a number of vials of tolerably thick glass, some of which were of the same diameter as the cistern, and I spent the day in slowly working on these, endeavoring to cut them of the requisite length; but as my instrument was a very rough file, I invariably broke them. A groove was cut in one of the trees, where the barometer was placed during the night, to be out of the way of any possible danger, and in the morning I commenced again. Among the powder horns in the camp, I found one which was very transparent, so that its contents could be almost as plainly

seen as through glass. This I boiled, and stretched on a piece of wood to the requisite diameter, and scraped it very thin, in order to increase to the utmost its transparency. I then secured it firmly in its place on the instrument with strong glue, made from a buffalo, and filled it with mercury properly heated. A piece of skin, which had covered one of the phials, furnished a good pocket, which was well secured with strong thread and glue, and then the brass cover was screwed to its place. The instrument was left some time to dry, and when I reversed it, a few hours after, I had the satisfaction to find it in perfect order; its indications being about the same as on the other side of the lake, before it had been broken. Our success in this little incident diffused pleasure throughout the camp, and we immediately set about our preparations for ascending the mountains.

As will be seen, on reference to a map, on this short mountain chain are the head waters of four great rivers of the continent; namely, the Colorado, Columbia, Missouri, and Platte rivers. It had been my design, after having ascended the mountains, to continue our route on the western side of the range, and crossing through a pass at the northwestern end of the chain, about thirty miles from our present camp, return along the eastern slope, across the heads of the Yellowstone river, and join on the line to our station of August 7, immediately at the foot of the ridge. In this way I should be enabled to include the whole chain, and its numerous waters, in my survey; but various considerations induced me, very reluctantly, to abandon this plan.

I was desirous to keep strictly within the scope of my instructions, and it would have required ten or fifteen additional days for the accomplishment of this object; our animals had become very much worn out with the length of the journey; game was very scarce; and, though it does not appear in the course of the narrative, as I have avoided dwelling upon trifling incidents not connected with the objects of the expedition, the spirits of the men had been much exhausted by the hardships and privations to which they had been subjected. Our provisions had well nigh all disappeared. Bread had been long out of the question, and of all our stock we had remaining two or three pounds of coffee, and a small quantity of macaroni, which had been husbanded with great care for the mountain expedition we were about to undertake. Our daily meal consisted of dry buffalo meat, cooked in tallow; and, as we had not dried this with Indian skill, part of it was spoiled; and what remained of good, was as hard as wood, having much the taste and appearance of so many pieces of bark. Even of this our stock was rapidly diminishing in a camp which was capable of consuming two buffalo in every twenty-four hours. These animals had entirely disappeared, and it was not probable that we should fall in with them again until we returned to the Sweet Water.

Our arrangements for the ascent were rapidly completed; we were in a hostile country, which rendered the greatest vigilance and circumspection necessary. The pass at the north end of the mountain was generally infested by Blackfeet, and immediately opposite was one of their forts, on the edge of a little thicket, two or three hundred feet from our encampment. We were posted in a grove of beech, on the margin of the lake, and a few hundred feet long, with a narrow *prairillon* on the inner side, bordered by the rocky ridge. In the upper end of this grove we cleared a circular space about forty feet in diameter, and with the felled timber and interwoven branches surrounded it with a breastwork five feet in height. A gap was left

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for a gate on the inner side, by which the animals were to be driven in and secured, while the men slept around the little work. It was half hidden by the foliage; and garrisoned by twelve resolute men, would have set at defiance any band of savages which might chance to discover them in the interval of our absence. Fifteen of the best mules, with fourteen men, were selected for the mountain party. Our provisions consisted of dried meat for two days, with our little stock of coffee and some macaroni. In addition to the barometer and a thermometer, I took with me a sextant and spyglass, and we had, of course, our compasses. In charge of the camp I left Bernier, one of my most trustworthy men, who possessed the most determined courage.

August 12.—Early in the morning we left the camp, fifteen in number, well armed of course, and mounted on our best mules. A pack animal carried our provisions, with a coffee-pot and kettle, and three or four tin cups. Every man had a blanket strapped over his saddle to serve for his bed, and the instruments were carried by turns on their backs. We entered directly on rough and rocky ground; and, just after crossing the ridge, had the good fortune to shoot an antelope. We heard the roar, and had a glimpse of a waterfall as we rode along; and crossing in our way two fine streams, tributary to the Colorado, in about two hours ride we reached the top of the first row or range of the mountains. Here, again, a view of the most romantic beauty met our eyes. It seemed as if, from the vast expanse of uninteresting prairie we had passed over, nature had collected all her beauties together in one chosen place. We were overlooking a deep valley, which was entirely occupied by three lakes, and from the brink the surrounding ridges rose precipitously five hundred and a thousand feet, covered with the dark green of the balsam pine, relieved on the border of the lake with the light foliage of the aspen. They all communicated with each other, and the green of the waters, common to mountain lakes of great depth, showed that it would be impossible to cross them. The surprise manifested by our guides when these impassable obstacles suddenly barred our progress, proved that they were among the hidden treasures of the place, unknown even to the wandering trappers of the region. Descending the hill, we proceeded to make our way along the margin to the southern extremity. A narrow strip of angular fragments of rock, sometimes afforded a rough pathway for our mules, but generally we rode along the shelving side, occasionally scrambling up at a considerable risk of tumbling back into the lake.

The slope was frequently 60°; the pines grew densely together, and the ground was covered with the branches and trunks of trees. The air was fragrant with the odour of the pines; and I realized this delightful morning the pleasure of breathing that mountain air which makes a constant theme of the hunter's praise, and which now made us feel as if we had all been drinking some exhilarating gas. The depths of this unexplored forest were a place to delight the heart of a botanist. There was a rich undergrowth of plants, and numerous gay colored flowers in brilliant bloom. We reached the outlet at length, where some freshly barked willows that lay in the water showed that heaven had been recently at work. There were some small brown squirrels jumping about in the pines, and a couple of large mallard ducks swimming about in the stream.

The hills on this southern end were low, and the lake looked like a mimic sea, as the waves broke on the sandy beach in the force of a strong breeze. There was a pretty, open spot, with fine grass for our mules, and we made

our noon halt on the beach, under the shade of some large hemlocks. We resumed our journey after a halt of about an hour, making our way up the ridge on the western side of the lake. In search of smoother ground, we rode a little inland; and, passing through groves of aspen, soon found ourselves again among the pines. Emerging from these, we struck the summit of the ridge above the upper end of the lake.

We had reached a very elevated point, and in the valley below, and among the hills, were a number of lakes at different levels; some, two or three hundred feet above others, with which they communicated by foaming torrents. Even to our great height the roar of the cataracts came up, and we could see them leaping down in lines of snowy foam. From this scene of busy waters, we turned abruptly into the stillness of a forest, where we rode among the open bolls of the pines over a lawn of verdant grass, having strikingly the air of cultivated grounds. This led us, after a time, among masses of rock which had no vegetable earth but in hollows and crevices, though still the pine forest continued. Toward evening, we reached a defile, or rather a hole in the mountains, entirely shut in by dark pine-covered rocks.

A small stream, with a scarcely perceptible current, flowed through a level bottom of perhaps eighty yards width, where the grass was saturated with water. Into this the mules were turned, and were neither hobbled nor picketed during the night, as the fine pasturage took away all temptation to stray; and we made our bivouac in the pines. The surrounding masses were all of granite. While supper was being prepared, I set out on an excursion in the neighborhood, accompanied by one of my men. We wandered about among the crags and ravines until dark, richly repaid for our walk by a fine collection of plants, many of them in full bloom. Ascending a peak to find the place of our camp, we saw that the little defile in which we lay communicated with the long green valley of some stream, which, here locked up in the mountains, far away to the south found its way in a dense forest to the plains.

Looking along its upward course, it seemed to conduct by a smooth gradual slope directly toward the peak, which, from long consultation as we approached the mountain, we had decided to be the highest of the range. Pleased with the discovery of so fine a road for the next day, we hastened down to the camp, where we arrived just in time for supper. Our table service was rather scant, and we held the meat in our hands; and clean rocks made good plates, on which we spread our macaroni. Among all the strange places on which we had occasion to encamp during our long journey, none have left so vivid an impression on my mind as the camp of this evening. The disorder of the masses which surrounded us; the little hole through which we saw the stars overhead; the dark pines where we slept; and the rocks lit up with the glow of our fires, made a night-picture of very wild beauty.

August 13.—The morning was bright and pleasant, just cool enough to make exercise agreeable, and we soon entered the defile I had seen the preceding day. It was smoothly carpeted with a soft grass, and scattered over with groups of flowers, of which yellow was the predominant color. Sometimes we were forced by an occasional difficult pass to pick our way on a narrow ledge along the side of the defile, and the mules were frequently on their knees; but these obstructions were rare, and we journeyed on in the sweet morning air, delighted at our good fortune in having found such a beautiful entrance to the mountains. This road continued for about three

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miles, when we suddenly reached its termination in one of the grand views, which, at every turn, meet the traveller in this magnificent region. Here the defile up which we had travelled, opened out into a small lawn, where, in a little lake, the stream had its source.

There were some fine *asters* in bloom, but all the flowering plants appeared to seek the shelter of the rocks, and to be of lower growth than below, as if they loved the warmth of the soil and kept out of the way of the winds. Immediately at our feet a precipitous descent led to a confusion of defiles, and before us rose the mountains as we have represented them in the annexed view. It is not by the splendor of far off views, which have lent such a glory to the Alps, that these impress the mind; but by a gigantic disorder of enormous masses, and a savage sublimity of naked rock, in wonderful contrast with innumerable green spots of a rich floral beauty, shut up in their stern recesses. Their wildness seems well suited to the character of the people who inhabit the country.

I determined to leave our animals here, and make the rest of our way on foot. The peak appeared so near that there was no doubt of our returning before night, and a few men were left in charge of the mules, with our provisions and blankets. We took with us nothing but our arms and instruments, and as the day had become warm, the greater part left our coats. Having made an early dinner, we started again. We were soon involved in the most ragged precipices, nearing the central chain very slowly, and rising but little. The first ridge hid a succession of others, and when with great fatigue and difficulty we had climbed up five hundred feet, it was but to make an equal descent on the other side; all these intervening places were filled with small deep lakes, which met the eye in every direction, descending from one level to another, sometimes under bridges formed by huge fragments of granite, beneath which was heard the roar of the water. These constantly obstructed our path, forcing us to make long *détours*; frequently obliged to retrace our steps, and frequently falling among the rocks. Maxwell was precipitated toward the face of a precipice, and saved himself from going over by throwing himself flat on the ground. We clambered on, always expecting with every ridge that we crossed, to reach the foot of the peaks, and always disappointed, until about 4 o'clock, when, pretty well worn out, we reached the shore of a little lake, in which there was a rocky island, and from which we obtained the view given in the frontispiece. We remained here a short time to rest, and continued on around the lake, which had in some places a beach of white sand, and in others, was bound with rocks, over which the way was difficult and dangerous, as the water from innumerable springs made them very slippery.

By the time we had reached the further side of the lake, we found ourselves all exceedingly fatigued, and much to the satisfaction of the whole party, we encamped. The spot we had chosen was a broad flat rock, in some measure protected from the winds by the surrounding crags, and the trunks of fallen pines afforded us bright fires. Near by was a foaming torrent, which tumbled into the little lake about one hundred and fifty feet below us, and which, by way of distinction, we have called Island lake. We had reached the upper limit of the piney region; as, above this point, no tree was to be seen, and patches of snow lay everywhere around us on the cold sides of the rocks. The flora of the region we had traversed since leaving our mules was extremely rich, and among the characteristic plants, the scarlet flowers of the *dodecatheon dentatum* everywhere met the eye in great abun-

dance. A small green ravine, on the edge of which we were encamped, was filled with a profusion of Alpine plants in brilliant bloom. From barometrical observations, made during our three days' sojourn at this place, its elevation above the Gulf of Mexico is 10,000 feet. During the day, we had seen no sign of animal life; but among the rocks here, we heard what was supposed to be the bleat of a young goat, which we searched for with hungry activity, and found to proceed from a small animal of a gray color, with short ears and no tail; probably the Siberian squirrel. We saw a considerable number of them, and with the exception of a small bird like a sparrow, it is the only inhabitant of this elevated part of the mountains. On our return, we saw, below this lake, large flocks of the mountain goat. We had nothing to eat to-night. Lajeunesse, with several others, took their guns, and sallied out in search of a goat; but returned unsuccessful. At sunset, the barometer stood at 20.522—the attached thermometer 50°. Here we had the misfortune to break our thermometer, having now only that attached to the barometer. I was taken ill shortly after we had encamped, and continued so until late in the night, with violent headache and vomiting. This was probably caused by the excessive fatigue I had undergone, and want of food, and perhaps also in some measure by the rarity of the air. The night was cold, as a violent gale from the north had sprung up at sunset, which entirely blew away the heat of the fires. The cold, and our granite beds, had not been favorable to sleep, and we were glad to see the face of the sun in the morning. Not being delayed by any preparation for breakfast, we set out immediately.

On every side as we advanced was heard the roar of waters, and of a torrent, which we followed up a short distance, until it expanded into a lake about one mile in length. On the northern side of the lake was a bank of ice, or rather of snow, covered with a crust of ice. Carson had been our guide into the mountains, and agreeably to his advice, we left this little valley, and took to the ridges again; which we found extremely broken, and where we were again involved among precipices. Here were ice fields, among which we were all dispersed, seeking each the best path to ascend the peak. Mr. Preuss attempted to walk along the upper edge of one of these fields, which sloped away at an angle of about twenty degrees, but his feet slipped from under him, and he went plunging down the plane. A few hundred feet below, at the bottom, were some fragments of sharp rock, on which he landed; and though he turned a couple of somersets, fortunately received no injury beyond a few bruises. Two of the men, Clément Lambert and Descoteaux, had been taken ill, and laid down on the rocks a short distance below; and at this point I was attacked with headache and giddiness, accompanied by vomiting, as on the day before. Finding myself unable to proceed, I sent the barometer over to Mr. Preuss, who was in a gap two or three hundred yards distant, desiring him to reach the peak if possible, and take an observation there. He found himself unable to proceed further in that direction, and took an observation where the barometer stood, at 19.401—attached thermometer 50°, in the gap. Carson, who had gone over to him, succeeded in reaching one of the snowy summits of the main ridge, whence he saw the peak towards which all our efforts had been directed, towering eight or ten hundred feet into the air above him. In the meantime, finding myself grow rather worse than better, and doubtful how far my strength would carry me, I sent Basil Lajeunesse, with four men, back to the place where the mules had been left.

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We were now better acquainted with the topography of the country, and I directed him to bring back with him, if it were in any way possible, four or five mules, with provisions and blankets. With me were Maxwell and Ayot; and after we had remained nearly an hour on the rock, it became so unpleasantly cold, though the day was bright, that we set out on our return to the camp, at which we all arrived safely, straggling in one after the other. I continued ill during the afternoon, but became better towards sundown, when my recovery was completed by the appearance of Basil and four men, all mounted. The men who had gone with him had been too much fatigued to return, and were relieved by those in charge of the horses; but in his powers of endurance Basil resembled more a mountain goat than a man. They brought blankets and provisions, and we enjoyed well our dried meat and a cup of good coffee. We rolled ourselves up in our blankets, and with our feet turned to a blazing fire, slept soundly until morning.

August 15.—It had been supposed that we had finished with the mountains; and the evening before, it had been arranged that Carson should set out at daylight, and return to breakfast at the Camp of the Mules, taking with him all but four or five men, who were to stay with me and bring back the mules and instruments. Accordingly, at the break of day they set out. With Mr. Preuss and myself remained Basil Lajeunesse, Clément Lambert, Janisse, and Descoteaux. When we had secured strength for the day by a hearty breakfast, we covered what remained, which was enough for one meal, with rocks, in order that it might be safe from any marauding bird; and, saddling our mules, turned our faces once more towards the peaks. This time we determined to proceed quietly and cautiously, deliberately resolved to accomplish our object if it were within the compass of human means. We were of opinion that a long defile which lay to the left of yesterday's route would lead us to the foot of the main peak. Our mules had been refreshed by the fine grass in the little ravine at the island camp, and we intended to ride up the defile as far as possible, in order to husband our strength for the main ascent. Though this was a fine passage, still it was a defile of the most rugged mountains known, and we had many a rough and steep slippery place to cross before reaching the end. In this place the sun rarely shone, snow lay along the border of the small stream which flowed through it, and occasional icy passages made the footing of the mules very insecure, and the rocks and ground were moist with the trickling waters in this spring of mighty rivers. We soon had the satisfaction to find ourselves riding along the huge wall which forms the central summits of the chain. There at last it rose by our sides, a nearly perpendicular wall of granite, terminating 2,000 to 3,000 feet above our heads in a serrated line of broken, jagged cones. We rode on until we came almost immediately below the main peak, which I denominated the *Star Peak*, as it exhibited more snow to the eye than any of the neighboring summits. Here were three small lakes of a green color, each of perhaps a thousand yards in diameter, and apparently very deep. These lay in a kind of chasm; and, according to the barometer, we had attained but a few hundred feet above the Island lake. The barometer here stood at 20,450, attached thermometer 70°.

We managed to get our mules up to a little bench about a hundred feet above the lakes, where there was a patch of good grass, and turned them loose to graze. During our rough ride to this place they had exhibited a wonderful surefootedness. Parts of the defile were filled with angular,

sharp fragments of rock, three or four and eight or ten feet cube; and among these they had worked their way, leaping from one narrow point to another, rarely making a false step, and giving us no occasion to dismount. Having divested ourselves of every unnecessary encumbrance, we commenced the ascent. This time, like experienced travellers, we did not press ourselves, but climbed leisurely, sitting down so soon as we found breath beginning to fail. At intervals we reached places where a number of springs gushed from the rocks, and about 1,800 feet above the lakes came to the snow line. From this point our progress was uninterrupted climbing. Hitherto I had worn a pair of thick mocassins, with soles of *parfleche*; but here I put on a light thin pair, which I had brought for the purpose, as now the use of our toes became necessary to a further advance. I availed myself of a sort of comb of the mountain, which stood against the wall like a buttress, and which the wind and the solar radiation, joined to the steepness of the smooth rock, had kept almost entirely free from snow. Up this I made my way rapidly. Our cautious method of advancing in the outset had spared my strength; and, with the exception of a slight disposition to headache, I felt no remains of yesterday's illness. In a few minutes we reached a point where the buttress was overhanging, and there was no other way of surmounting the difficulty than by passing around one side of it, which was the face of a vertical precipice of several hundred feet.

Putting hands and feet in the crevices between the blocks, I succeeded in getting over it, and when I reached the top, found my companions in a small valley below. Descending to them, we continued climbing, and in a short time reached the crest. I sprang upon the summit, and another step would have precipitated me into an immense snow field five hundred feet below. To the edge of this field was a sheer icy precipice; and then, with a gradual fall, the field sloped off for about a mile, until it struck the foot of another lower ridge. I stood on a narrow crest, about three feet in width, with an inclination of about 20° N. 51° E. As soon as I had gratified the first feelings of curiosity I descended, and each man ascended in his turn, for I would only allow one at a time to mount the unstable and precarious slab, which it seemed a breath would hurl into the abyss below. We mounted the barometer in the snow of the summit, and fixing a ramrod in a crevice, unfurled the national flag to wave in the breeze where never flag waved before. During our morning's ascent we had met no sign of animal life except the small sparrow-like bird already mentioned. A stillness the most profound and a terrible solitude forced themselves constantly on the mind as the great features of the place. Here on the summit, where the stillness was absolute, unbroken by any sound, and the solitude complete, we thought ourselves beyond the region of animated life, but while we were sitting on the rock a solitary bee (*bromus*, the *humble bee*) came winging his flight from the eastern valley, and lit on the knee of one of the men.

It was a strange place, the icy rock and the highest peak of the Rocky Mountains, for a lover of warm sunshine and flowers, and we pleased ourselves with the idea that he was the first of his species to cross the mountain barrier, a solitary pioneer to tell the advance of civilization. I believe that a moment's thought would have made us let him continue his way unharmed, but we carried out the law of this country, where all animated nature seems at war; and seizing him immediately, put him in at least a fit place, in the leaves of a large book among the flowers we had collected on

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our way. The barometer stood at 18,293. The attached thermometer at 44°, giving for the elevation of this summit 13,570 feet above the Gulf of Mexico, which may be called the highest flight of the bee. It is certainly the highest known flight of that insect. From the description given by Mackenzie of the mountains where he crossed them, with that of a French officer still further to the north, and Colonel Long's measurements to the south, joined to the opinion of the oldest traders of the country, it is presumed that this is the highest peak of the Rocky Mountains. The day was sunny and bright, but a slight shining mist hung over the lower plains, which interfered with our view of the surrounding country. On one side we overlooked innumerable lakes and streams, the spring of the Colorado of the Gulf of California; and on the other was the Wind River valley, where were the heads of the Yellowstone branch of the Missouri; far to the north we just could discover the snowy heads of the *Trois Tetons*, where were the sources of the Missouri and Columbia rivers; and at the southern extremity of the ridge the peaks were plainly visible among which were some of the springs of the Nebraska or Platte river. Around us the whole scene had one main striking feature, which was that of terrible convulsion. Parallel to its length, the ridge was split into chasms and fissures; between which rose the thin lofty walls, terminated with slender minarets and columns, which is correctly represented in the view from the camp on Island lake. According to the barometer, the little crest of the wall on which we stood was three thousand five hundred and seventy feet above that place, and two thousand seven hundred and eighty above the little lakes at the bottom, immediately at our feet. Our camp at the Two Hills (an astronomical station) bore south 30° east, which, with a bearing afterward obtained from a fixed position, enabled us to locate the peak. The bearing of the *Trois Tetons* was north 50° west, and the direction of the central ridge of the Wind River mountains south 39° east. The summit rock was gneiss, succeeded by syenitic gneiss. Syenite and feldspar succeeded in our descent to the snow line, where we found a feldspathic granite. I had remarked that the noise produced by the explosion of our pistols had the usual degree of loudness, but was not in the least prolonged, expiring almost instantaneously. Having now made what observations our means afforded, we proceeded to descend. We had accomplished an object of laudable ambition, and beyond the strict order of our instructions. We had climbed the loftiest peak of the Rocky Mountains, and looked down upon the snow a thousand feet below, and standing where never human foot had stood before, felt the exultation of first explorers. It was about 2 o'clock when we left the summit, and when we reached the bottom the sun had already sunk behind the wall, and the day was drawing to a close. It would have been pleasant to have lingered here and on the summit longer, but we hurried away as rapidly as the ground would permit, for it was an object to regain our party as soon as possible, not knowing what accident the next hour might bring forth.

We reached our deposit of provisions at nightfall. Here was not the inn which awaits the tired traveller on his return from Mont Blanc, or the orange groves of South America, with their refreshing juices and soft fragrant air; but we found our little cache of dried meat and coffee undisturbed. Though the moon was bright, the road was full of precipices, and the fatigue of the day had been great. We therefore abandoned the idea of rejoining our friends, and lay down on the rock, and, in spite of the cold, slept soundly.

August 16.—We left our encampment with the daylight. We saw on

our way large flocks of the mountain goat looking down on us from the cliffs. At the crack of a rifle they would bound off among the rocks, and in a few minutes make their appearance on some lofty peak, some hundred or a thousand feet above. It is needless to attempt any further description of the country; the portion over which we travelled this morning was rough as imagination could picture it, and to us seemed equally beautiful. A concourse of lakes and rushing waters, mountains of rocks naked and destitute of vegetable earth, dells and ravines of the most exquisite beauty, all kept green and fresh by the great moisture in the air, and sown with brilliant flowers, and every where thrown around all the glory of most magnificent scenes; these constitute the features of the place, and impress themselves vividly on the mind of the traveller. It was not until 11 o'clock that we reached the place where our animals had been left, when we first attempted the mountains on foot. Near one of the still burning fires we found a piece of meat, which our friends had thrown away, and which furnished us a monthful—a very scanty breakfast. We continued directly on, and reached our camp on the mountain lake at dusk. We found all well. Nothing had occurred to interrupt the quiet since our departure, and the fine grass and good cool water had done much to re-establish our animals. All heard with great delight the order to turn our faces homeward; and toward sundown of the 17th, we encamped again at the Two Buttes.

In the course of this afternoon's march, the barometer was broken past remedy. I regretted it, as I was desirous to compare it again with Dr. Engelmann's barometers at St. Louis, to which mine were referred; but it had done its part well, and my objects were mainly fulfilled.

August 19.—We left our camp on Little Sandy river about 7 in the morning, and traversed the same sandy undulating country. The air was filled with the turpentine scent of the various *artemisia's*, which are now in bloom, and numerous as they are, give much gaiety to the landscape of the plains. At 10 o'clock, we stood exactly on the divide in the pass, where the wagon road crosses, and descending immediately upon the Sweet Water, halted to take a meridian observation of the sun. The latitude was $42^{\circ} 24' 39''$.

In the course of the afternoon we saw buffalo again, and at our evening halt on the Sweet Water, the roasted ribs again made their appearance around the fires, and with them, good humor and laughter, and song were restored to the camp. Our coffee had been expended, but we now made a kind of tea from the roots of the wild cherry tree.

August 23.—Yesterday evening we reached our encampment at Rock Independence, where I took some astronomical observations. Here, not unmindful of the custom of early travellers and explorers in our country, I engraved on this rock of the Far West a symbol of the Christian faith. Among the thickly inscribed names, I made on the hard granite the impression of a large cross, which I covered with a black preparation of India rubber, well calculated to resist the influence of wind and rain. It stands amidst the names of many who have long since found their way to the grave, and for whom the huge rock is a giant grave stone.

One George Weymouth was sent out to Maine by the Earl of Southampton, Lord Arundel, and others; and in the narrative of their discoveries, he says: "The next day, we ascended in our pinnace, that part of the river which lies more to the westward, carrying with us a cross—a thing never omitted by any Christian traveller—which we erected at the ultimate

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end of our route." This was in the year 1603, and in 1842, I obeyed the feeling of early travellers, and left the impression of the cross deeply engraved on the vast rock one thousand miles beyond the Mississippi, to which discoverers have given the national name of *Rock Independence*.

In obedience to my instructions to survey the river Platte, if possible, I had determined to make an attempt at this place. The India rubber boat was filled with air, placed in the water, and loaded with what was necessary for our operations; and I embarked with Mr. Preuss and a party of men. When we had dragged our boat for a mile or two over the sands, I abandoned the impossible undertaking, and waited for the arrival of the party, when we packed up our boat and equipage, and at 9 o'clock were again moving along on our land journey. We continued along the valley on the right bank of the Sweet Water, where the formation, as already described, consists of a grayish micaceous sandstone, and fine-grained conglomerate, and marl. We passed over a ridge which borders or constitutes the river hills of the Platte, consisting of huge blocks sixty or eighty feet cube of decomposing granite. The cement which united them was probably of easier decomposition, and has disappeared and left them isolate, and separated by small spaces. Numerous horns of the mountain goat were lying among the rocks, and in the ravines were cedars whose trunks were of extraordinary size. From this ridge we descended to a small open plain at the mouth of the Sweet Water, which rushed with a rapid current into the Platte, here flowing along in a broad, tranquil, and apparently deep stream, which seemed, from its turbid appearance to be considerably swollen. I obtained here some astronomical observations, and the afternoon was spent in getting our boat ready for navigation the next day.

August 24.—We started before sunrise, intending to breakfast at Goat island. I had directed the land party, in charge of Bernier, to proceed to this place, where they were to remain, should they find no note to apprise them of our having passed. In the event of receiving this information, they were to continue their route, passing by certain places which had been designated. Mr. Preuss accompanied me, and with us were five of my best men, viz., C. Lambert, Basil Lajeunesse, Honoré Ayot, Benoist, and Descoteaux. Here appeared no scarcity of water, and we took on board, with various instruments and baggage, provisions for ten or twelve days. We paddled down the river rapidly, for our little craft was light as a duck on the water, and the sun had been some time risen, when we heard before us a hollow roar, which we supposed to be that of a fall of which we had heard a vague rumor, but whose exact locality no one had been able to describe to us. We were approaching a ridge, through which the river passes by a place called "cañon" (pronounced *kanyon*), a Spanish word, signifying a piece of artillery, the barrel of a gun, or any kind of tube; and which, in this country, has been adopted to describe the passage of a river between perpendicular rocks of great height, which frequently approach each other so closely overhead as to form a kind of tunnel over the stream, which foams along below, half-choked up by fallen fragments. Between the mouth of the Sweet Water and Goat island, there is probably a fall of three hundred feet, and that was principally made in the cañons before us; as without them, the water was comparatively smooth. As we neared the ridge, the river made a sudden turn, and swept squarely down against one of the walls of the cañon with a great velocity and so steep a descent, that it had to the eye the appearance of an inclined plane.

When we launched into this, the men jumped overboard, to check the velocity of the boat, but were soon in water up to their necks, and our boat ran on; but we succeeded in bringing her to a small point of rocks on the right, at the mouth of the cañon. Here was a kind of elevated sand beach, not many yards square, backed by the rocks, and around the point the river swept at a right angle. Trunks of trees deposited on jutting points twenty or thirty feet above, and other marks, showed that the water here frequently rose to a considerable height. The ridge was of the same decomposing granite already mentioned, and the water had worked the surface, in many places, into a wavy surface of ridges and holes. We ascended the rocks to reconnoitre the ground, and from the summit the passage appeared to be a continued cataract foaming over many obstructions, and broken by a number of small falls. We saw nowhere a fall answering to that which had been described to us as having twenty or twenty five feet, but still concluded this to be the place in question; as in the season of floods, the rush of the river against the wall would produce a great rise, and the waters reflected squarely off, would descend through the passage in a sheet of foam, having every appearance of a large fall. Eighteen years previous to this time, as I have subsequently learned from himself, Mr. Fitzpatrick, somewhere above on this river, had embarked with a valuable cargo of beaver. Unacquainted with the stream, which he believed would conduct him safely to the Missouri, he came unexpectedly into this cañon, where he was wrecked, with the total loss of his furs. It would have been a work of great time and labor to pack our baggage across the ridge, and I determined to run the cañon. We all again embarked, and at first attempted to check the way of the boat; but the water swept through with so much violence that we narrowly escaped being swamped, and were obliged to let her go in the full force of the current, and trust to the skill of the boatmen. The dangerous places in this cañon were where huge rocks had fallen from above, and hemmed in the already narrow pass of the river to an open space of three or four and five feet. These obstructions raised the water considerably above, which was sometimes precipitated over in a fall; and at other places, where this dam was too high, rushed through the contracted opening with tremendous violence. Had our boat been made of wood, in passing the narrows she would have been staved; but her elasticity preserved her unhurt from every shock, and she seemed fairly to leap over the falls.

In this way we passed three cataracts in succession, where, perhaps, a hundred feet of smooth water intervened; and finally, with a shout of pleasure at our success, issued from our tunnel into the open day beyond. We were so delighted with the performance of our boat, and so confident in her powers, that we would not have hesitated to leap a fall of ten feet with her. We put to shore for breakfast at some willows on the right bank, immediately below the mouth of the cañon; for it was now eight o'clock, and we had been working since daylight, and were all wet, fatigued, and hungry. While the men were preparing breakfast, I went out to reconnoitre. The view was very limited. The course of the river was smooth, so far as I could see; on both sides were broken hills; and but a mile or two below was another high ridge. The rock at the mouth of the cañon was still the decomposing granite, with great quantities of mica, which made a very glittering sand.

We re-embarked at 9 o'clock, and in about twenty minutes reached the next cañon. Landing on a rocky shore at its commencement, we ascended

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the ridge to reconnoitre. Portage was out of the question. So far as we could see, the jagged rocks pointed out the course of the cañon, on a wind-
ing line of seven or eight miles. It was simply a narrow, dark chasm in
the rock; and here the perpendicular faces were much higher than in the
previous pass, being at this end two to three hundred, and further down, as
we afterward ascertained, five hundred feet in vertical height. Our previous
success had made us bold, and we determined again to run the cañon.
Every thing was secured as firmly as possible; and, having divested our-
selves of the greater part of our clothing, we pushed into the stream. To
save our chronometer from accident, Mr. Preuss took it, and attempted to
proceed along the shore on the masses of rock, which in places were piled
up on either side; but, after he had walked about five minutes, every thing
like shore disappeared, and the vertical wall came squarely down into the wa-
ter. He, therefore, waited until we came up. An ugly pass lay before us.
We had made fast to the stern of the boat a strong rope about fifty feet long;
and three of the men clambered along among the rocks, and with this rope
let her down slowly through the pass. In several places high rocks lay scat-
tered about in the channel; and in the narrows it required all our strength
and skill to avoid staving the boat on the sharp points. In one of these, the
boat proved a little too broad, and stuck fast for an instant, while the water
flew over us; fortunately it was but for an instant, as our united strength
forced her immediately through. The water swept overboard only a sextant
and a pair of saddle bags. I caught the sextant as it passed by me; but the
saddlebags became the prey of the whirlpools. We reached the place where
Mr. Preuss was standing, took him on board, and, with the aid of the boat,
put the men with the rope on the succeeding pile of rocks. We found this
passage much worse than the previous one, and our position was rather a bad
one. To go back was impossible; before us the cataract was a sheet of
foam; and, shut up in the chasm by the rocks, which in some places seemed
almost to meet overhead, the roar of the water was deafening. We pushed
off again; but, after making a little distance, the force of the current became
too great for the men on shore, and two of them let go the rope. Lajeunesse,
the third man, hung on, and was jerked headforemost into the river from a
rock about twelve feet high; and down the boat shot like an arrow, Basil
following us in the rapid current, and exerting all his strength to keep in
mid channel—his head only seen occasionally like a black spot in the white
foam. How far we went I do not exactly know; but we succeeded in turn-
ing the boat into an eddy below. "Cré Dieu," said Basil Lajeunesse, as
he arrived immediately after us, "Je crois bien que j'ai nagé un demi mile."
He had owed his life to his skill as a swimmer; and I determined to take
him and the two others on board, and trust to skill and fortune to reach the
other end in safety. We placed ourselves on our knees, with the short pad-
dles in our hands, the most skilful boatman being at the bow; and again we
commenced our rapid descent. We cleared rock after rock, and shot past
fall after fall, our little boat seeming to play with the cataract. We became
flushed with success and familiar with the danger; and, yielding to the ex-
citement of the occasion, broke forth together into a Canadian boat song.
Singing, or rather shouting, we dashed along; and were, I believe, in the
midst of the chorus, when the boat struck a concealed rock immediately at
the foot of a fall, which whirled her over in an instant. Three of my men
could not swim, and my first feeling was to assist them, and save some of
our effects; but a sharp concussion or two convinced me that I had not yet

saved myself. A few strokes brought me into an eddy, and I landed on a pile of rocks on the left side. Looking around, I saw that Mr. Preuss had gained the shore on the same side, about twenty yards below; and a little climbing and swimming soon brought him to my side. On the opposite side, against the wall, lay the boat bottom up; and Lambert was in the act of saving Descoteaux, whom he had grasped by the hair, and who could not swim: "Lache pas," said he, as I afterward learned, "lache pas, chere frere." "Crains pas," was the reply, "Je m'en vais mourir avant que de te lâcher." Such was the reply of courage and generosity in this danger. For a hundred yards below, the current was covered with floating books and boxes, bales of blankets, and scattered articles of clothing; and so strong and boiling was the stream, that even our heavy instruments, which were all in cases, kept on the surface, and the sextant, circle, and the long black box of the telescope, were in view at once. For a moment, I felt somewhat disheartened. All our books; almost every record of the journey—our journals and registers of astronomical and barometrical observations—had been lost in a moment. But it was no time to indulge in regrets; and I immediately set about endeavoring to save something from the wreck. Making ourselves understood as well as possible by signs, for nothing could be heard in the roar of waters, we commenced our operations. Of every thing on board, the only article that had been saved was my double-barrelled gun, which Descoteaux had caught, and clung to with drowning tenacity. The men continued down the river on the left bank. Mr. Preuss and myself descended on the side we were on; and Lajeunesse, with a paddle in his hand, jumped on the boat alone, and continued down the cañon. She was now light, and cleared every bad place with much less difficulty. In a short time, he was joined by Lambert; and the search was continued for about a mile and a half, which was as far as the boat could proceed in the pass.

Here the walls were about five hundred feet high, and the fragments of rocks from above had choked the river into a hollow pass, but one or two feet above the surface. Through this and the interstices of the rock, the water found its way. Favored beyond our expectations, all of our registers had been recovered, with the exception of one of my journals, which contained the notes and incidents of travel, and topographical descriptions, a number of scattered astronomical observations, principally meridian altitudes of the sun, and our barometrical register west of Laramie. Fortunately, our other journals contained duplicates of the most important barometrical observations which had been taken in the mountains. These, with a few scattered notes, were all that had been preserved of our meteorological observations. In addition to these we saved the circle, and these, with a few blankets, constituted every thing that had been rescued from the waters.

The day was running rapidly away, and it was necessary to reach Goat island, whither the party had preceded us before night. In this uncertain country, the traveller is so much in the power of chance, that we became somewhat uneasy in regard to them. Should anything have occurred, in the brief interval of our separation, to prevent our rejoining them, our situation would be rather a desperate one. We had not a morsel of provisions, our arms and ammunition were gone; and we were entirely at the mercy of any straggling party of savages, and not a little in danger of starvation. We therefore set out at once in two parties. Mr. Preuss and myself on the left, and the men on the opposite side of the river. Climbing out of the

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cañon, we found ourselves in a very broken country, where we were not yet able to recognize any locality. In the course of our descent through the cañon, the rock, which at the upper end was of the decomposing granite, changed into a varied sandstone formation. The hills and points of the ridges were covered with fragments of a yellow sandstone, of which the strata were sometimes displayed in the broken ravines which interrupted our course, and made our walk extremely fatiguing. At one point of the cañon, the red argillaceous sandstone rose in a wall of five hundred feet, surmounted by a stratum of white sandstone, and in an opposite ravine a column of red sandstone rose in form like a steeple, about one hundred and fifty feet high. The scenery was extremely picturesque, and notwithstanding our forlorn condition, we were frequently obliged to stop and admire it. Our progress was not very rapid. We had emerged from the water half naked, and on arriving at the top of the precipice, I found myself with only one moccasin. The fragments of rock made walking painful, and I was frequently obliged to stop and pull out the thorns of the *cactus*, here the prevailing plant, and with which a few minutes walk covered the bottom of my feet. From this ridge the river emerged into a smiling prairie, and descending to the bank for water, we were joined by Benoist. The rest of the party were out of sight, having taken a more inland route. We crossed the river repeatedly, sometimes able to ford it, and sometimes swimming; climbed over the ridges of two more cañons, and toward evening reached the cut, which we here named the Hot Spring Gate. On our previous visit in July we had not entered this pass, reserving it for our descent in the boat; and when we entered it this evening, Mr. Preuss was a few hundred feet in advance. Heated with the long march, he came suddenly upon a fine bold spring, gushing from the rock, about ten feet above the river. Eager to enjoy the crystal water, he threw himself down for a hasty draught, and took a mouthful of water almost boiling hot. He said nothing to Benoist, who laid himself down to drink, but the steam from the water arrested his eagerness, and he escaped the hot draught. We had no thermometer to ascertain the temperature, but I could hold my hand in the water just long enough to count two seconds. There are eight or ten of these springs, discharging themselves by streams large enough to be called runs. A loud hollow noise was heard from the rock, which I supposed to be produced by the fall of the water. The strata immediately where they issue is a fine white and calcareous sandstone, covered with an incrustation of common salt. Leaving this Thermopylæ of the West, in a short walk, we reached the red ridge which has been described as lying just above Goat island. Ascending this we found some fresh tracks and a button, which showed that the other men had already arrived. A shout from the man who first reached the top of the ridge, responded to from below, informed us that our friends were all on the island, and we were soon among them. We found some pieces of buffalo standing around the fire for us, and managed to get some dry clothes among the people. A sudden storm of rain drove us into the best shelter we could find, where we slept soundly, after one of the most fatiguing days I have ever experienced.

August 25.—Early this morning Lajeunesse was sent to the wreck for the articles which had been saved, and about noon we left the island. The mare which we had left here in July had much improved in condition, and she served us well again for some time, but was finally abandoned at a subsequent part of the journey. At 10 in the morning of the 26th we reached

Cache camp, where we found every thing undisturbed. We disinterred our deposit, arranged our carts which had been left here on the way out, and travelling a few miles in the afternoon, encamped for the night at the ford of the Platte.

August 27.—At midday we halted at the place where we had taken dinner on the 27th of July. The country, which when we passed up looked as if the hard winter frosts had passed over it, had now assumed a new face, so much of vernal freshness had been given to it by the late rains. The Platte was exceedingly low, a mere line of water among the sand bars. We reached Laramie fort on the last day of August, after an absence of forty-two days, and had the pleasure to find our friends all well. The fortieth day had been fixed for our return, and the quick eyes of the Indians, who were on the lookout for us, discovered our flag as we wound among the hills. The fort saluted us with repeated discharges of its single piece, which we returned with scattered volleys of our small arms, and felt the joy of a home reception in getting back to this remote station, which seemed so far off as we went out.

On the morning of the 3d of September we bade adieu to our kind friends at the fort, and continued our homeward journey down the Platte, which was glorious with the autumnal splendor of innumerable flowers in full and brilliant bloom. On the warm sands, among the *helianthi*, one of the characteristic plants, we saw great numbers of rattlesnakes, of which five or six were killed in the morning's ride. We occupied ourselves in improving our previous survey of the river; and, as the weather was fine, astronomical observations were generally made at night and at noon.

We halted for a short time on the afternoon of the 5th with a village of Sioux Indians, some of whose chiefs we had met at Laramie. The water in the Platte was extremely low; in many places the large expanse of sands, with some occasional stunted trees on the banks, gave it the air of the seacoast, the bed of the river being merely a succession of sandbars, among which the channel was divided into rivulets a few inches deep. We crossed and recrossed with our carts repeatedly and at our pleasure, and whenever an obstruction barred our way, in the shape of precipitous bluffs that came down upon the river, we turned directly into it, and made our way along the sandy bed, with no other inconvenience than the frequent quicksands, which greatly fatigued our animals. Disinterring on the way the *cache* which had been made by our party when they ascended the river, we reached without accident, on the evening of the 12th of September, our old encampment of the 2d of July, at the junction of the forks. Our *cache* of the barrel of pork was found undisturbed, and proved a seasonable addition to our stock of provisions. At this place I had determined to make another attempt to descend the Platte by water, and accordingly spent two days in the construction of a bull boat. Men were sent out on the evening of our arrival, the necessary number of bulls killed, and their skins brought to the camp. Four of the best of them were strongly sewed together with buffalo sinew, and stretched over a basket frame of willow. The seams were then covered with ashes and tallow, and the boat left exposed to the sun for the greater part of one day, which was sufficient to dry and contract the skin, and make the whole work solid and strong. It had a rounded bow, was eight feet long and five broad, and drew with four men about four inches water. On the morning of the 15th we embarked in our hide boat, Mr. Preuss and myself, with two men. We dragged her over

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the sands for three or four miles, and then left her on a bar, and abandoned entirely all further attempts to navigate this river. The names given by the Indians are always remarkably appropriate, and certainly none was ever more so than that which they have given to this stream, "the Nebraska, or Shallow river." Walking steadily the remainder of the day, a little before dark we overtook our people at their evening camp, about twenty-one miles below the junction. The next morning we crossed the Platte, and continued our way down the river bottom on the left bank, where we found an excellent, plainly beaten road.

On the 18th we reached Grand island, which is fifty-two miles long, with an average breadth of one mile and three quarters. It has on it some small eminences, and is sufficiently elevated to be secure from the annual floods of the river. As has been already remarked, it is well timbered, with an excellent soil, and recommends itself to notice as the best point for a military position on the Lower Platte.

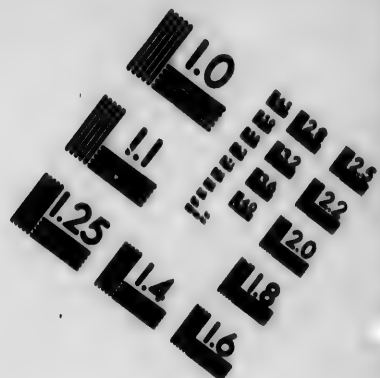
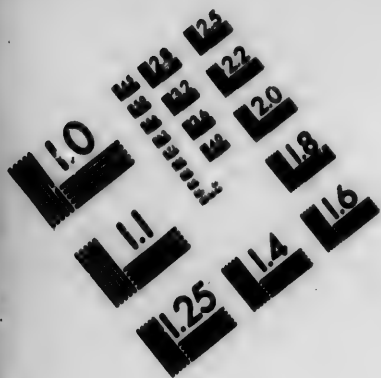
On the 22d we arrived at the village of the Grand Pawnees, on the right bank of the river, about thirty miles above the mouth of the Loup fork. They were gathering in their corn, and we obtained from them a very welcome supply of vegetables.

The morning of the 24th we reached the Loup fork of the Platte. At the place where we forded it, this stream was four hundred and thirty yards broad, with a swift current of clear water, in this respect differing from the Platte, which has a yellow muddy color, derived from the limestone and marl formation, of which we have previously spoken. The ford was difficult, as the water was so deep that it came into the body of the carts, and we reached the opposite bank after repeated attempts, ascending and descending the bed of the river in order to avail ourselves of the bars. We encamped on the left bank of the fork, in the point of land at its junction with the Platte. During the two days that we remained here for astronomical observations, the bad weather permitted us to obtain but one good observation for the latitude, a meridian altitude of the sun, which gave for the latitude of the mouth of the Loup fork, $41^{\circ} 22' 11''$.

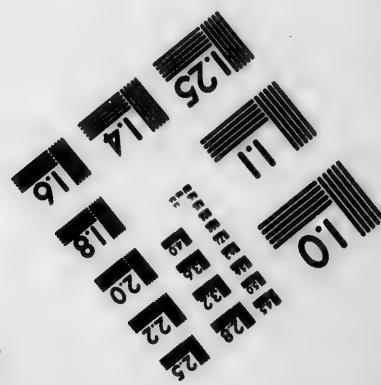
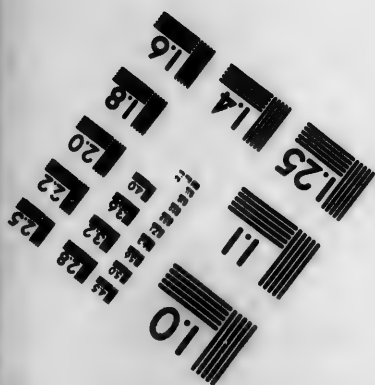
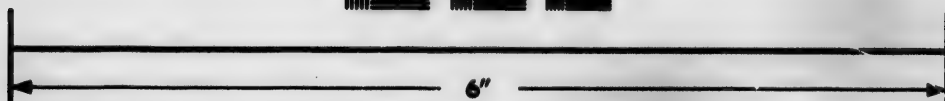
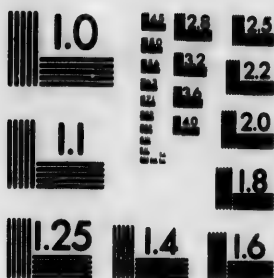
Five or six days previously I had sent forward C. Lambert, with two men, to Bellevue, with directions to ask from Mr. P. Sarpy, the gentleman in charge of the American Company's establishment at that place, the aid of his carpenters in constructing a boat, in which I proposed to descend the Missouri. On the afternoon of the 27th we met one of the men, who had been despatched by Mr. Sarpy with a welcome supply of provisions and a very kind note, which gave us the very gratifying intelligence that our boat was in rapid progress. On the evening of the 30th we encamped in an almost impenetrable undergrowth on the left bank of the Platte, in the point of land at its confluence with the Missouri, three hundred and fifteen miles, according to our reckoning, from the junction of the forks, and five hundred and twenty from Fort Laramie.

From the junction we had found the bed of the Platte occupied with numerous islands, many of them very large, and all well timbered; possessing, as well as the bottom lands of the river, a very excellent soil. With the exception of some scattered groves on the banks, the bottoms are generally without timber. A portion of these consist of low grounds, covered with a profusion of fine grasses, and are probably inundated in the spring; the remaining part is high river prairie, entirely beyond the influence of the floods. The breadth of the river is usually three quarters of a mile, except





**IMAGE EVALUATION
TEST TARGET (MT-3)**



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where it is enlarged by islands. That portion of its course which is occupied by Grand island, has an average breadth, from shore to shore, of two and a half miles. The breadth of the valley, with the various accidents of ground—springs, timber, and whatever I have thought interesting to travellers and seculers—you will find indicated on the larger map which accompanies this report.

October 1.—I rose this morning long before daylight, and heard with a feeling of pleasure the tinkling of cow-bells at the settlements on the opposite side of the Missouri. Early in the day we reached Mr. Sarpy's residence; and, in the security and comfort of his hospitable mansion, felt the pleasure of being again within the pale of civilization. We found our boat on the stocks; a few days sufficed to complete her; and, in the afternoon of the 4th, we embarked on the Missouri. All our equipage, horses, carts, and the *materiel* of the camp, had been sold at public auction at Bellevue. The strength of my party enabled me to man the boat with ten oars, relieved every hour; and we descended rapidly. Early on the morning of the 10th, we halted to make some astronomical observations at the mouth of the Kansas, exactly four months since we had left the trading-post of Mr. Cyprian Chouteau, on the same river, ten miles above. On our descent to this place, we had employed ourselves in surveying and sketching the Missouri, making astronomical observations regularly at night and at midday, whenever the weather permitted. These operations on the river were continued until our arrival at the city of St. Louis, Missouri, on the 17th; and will be found, imbedded with other results, on the map and in the appendices which accompany this report. At St. Louis, the sale of our remaining effects was made; and, leaving that city by steamboat on the 18th, I had the honor to report to you at the city of Washington on the 29th of October.

Very respectfully, sir, your obedient servant,

J. C. FREMONT,

2d Lieut. Corps of Topographical Engineers.

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CATALOGUE OF PLANTS

COLLECTED

BY LIEUT. FREMONT,

IN HIS

EXPEDITION TO THE ROCKY MOUNTAINS.

BY JOHN TORREY.

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PREFACE.

The collection of plants submitted to me for examination, though made under unfavorable circumstances, is a very interesting contribution to North American Botany. From the mouth of the Kansas river to the "Red Buttes" on the North fork of the Platte, the transportation was effected in carts; but from that place to and from the mountains, the explorations were made on horseback, and by such rapid movements, (which were necessary, in order to accomplish the objects of the expedition) that but little opportunity was afforded for collecting and drying botanical specimens. Besides, the party was in a savage and inhospitable country, sometimes annoyed by Indians, and frequently in great distress from want of provisions; from which circumstances, and the many pressing duties that constantly engaged the attention of the commander, he was not able to make so large a collection as he desired. To give some general idea of the country explored by Lieut. Fremont, I recapitulate, from his report, a brief sketch of his route. The expedition left the mouth of the Kansas on the 10th of June, 1842, and proceeding up that river about one hundred miles, then continued its course generally along the "bottoms" of the Kansas tributaries, but sometimes passing over the upper prairies. The soil of the river bottoms is always rich, and generally well timbered; though the whole region is what is called a prairie country. The upper prairies are an immense deposit of sand and gravel, covered with a good, and, very generally, a rich soil. Along the road, on reaching the little stream called Sandy creek (a tributary of the Kansas), the soil became more sandy. The rock-formations of this region are limestone and sandstone. The *Amorpha canescens* was the characteristic plant; it being in many places as abundant as the grass.

Crossing over from the waters of the Kansas, Lieut. F. arrived at the Great Platte, two hundred and ten miles from its junction with the Missouri. The valley of this river, from its mouth to the great forks, is about four miles broad, and three hundred and fifteen miles long. It is rich, well-timbered, and covered with luxuriant grasses. The purple *Liatris scariosa*, and several *Asters*, were here conspicuous features of the vegetation. I was pleased to recognise among the specimens collected near the forks, the fine large-flowered *Asclepias*, that I described many years ago in my account of James's Rocky Mountain Plants, under the name of *A. speciosa*, and which Mr. Geyer also found in Nicollet's expedition. It seems to be the plant subsequently described and figured by Sir W. Hooker, under the name of *A. Douglasii*. On the Lower Platte, and all the way to the Sweet Water, the showy *Cleome integrifolia* occurred in abundance. From the Forks to Laramie river, a distance of about two hundred miles, the country may be called a sandy one. The valley of the North fork is without timber; but the grasses are fine, and the herbaceous plants abundant. On the return of the expedition in September, Lieut. Fremont says the whole country resembled a vast garden; but the prevailing plants were two or three species of *Helianthus* (sunflower). Between the main forks of the Platte, from the junction, as high up as Laramie's fork, the formation consisted of marl, a soft earthy limestone, and a granite sandstone. At the latter place, that singular leguminous plant, the *Astrorhiza montana* of Nuttall was first seen, and then occurred, at intervals, to the Sweet Water river. Following up the North fork, Lieut. Fremont arrived at the mouth of the Sweet Water river, one of the head waters of the Platte. Above Laramie's fork to this place, the soil is generally sandy. The rocks consist of limestone, with a variety of sandstones (yellow, gray, and red argillaceous), with compact gypsum or alabaster, and fine conglomerates.

The route along the North fork of the Platte afforded some of the best plants in the collection. The *Senecio rufifolia*, Nutt., occurred in many places, quite to the Sweet Water; *Lippia*

(*Zapania*) *cuneifolia* (Torr. in James's plants, only known before from Dr. James's collection;) *Cercocarpus parvifolius*, Nutt.; *Eriogonum parvifolium* and *campitum*, Nutt.; *Shepherdia argentea*, Nutt., and *Geranium Fremontii*, a new species (near the Red Buttes), were found in this part of the journey. In saline soils, on the Upper Platte, near the mouth of the Sweet Water, were collected several interesting *Chenopodiaceæ*, one of which was first discovered by Dr. James, in Long's Expedition; and although it was considered as a new genus, I did not describe it, owing to the want of the ripe fruit. It is the plant doubtfully referred by Hooker, in his *Flora Boreali Americana*, to *Batis*. He had seen the male flowers only. As it is certainly a new genus, I have dedicated it to the excellent commander of the expedition, as a well-merited compliment for the services he has rendered North American Botany.

The Sweet Water valley is a sandy plain, about one hundred and twenty miles long, and generally about five miles broad; bounded by ranges of granitic mountains, between which, the valley formation consists, near the Devil's gate, of a grayish micaceous sandstone, with marl and white clay. At the encampment of August 5th-6th, there occurred a fine white argillaceous sandstone, a coarse sandstone or puddingstone, and a white calcareous sandstone. A few miles to the west of that position, Lieut. F. reached a point where the sandstone rested immediately upon the granite, which thenceforward, along his line of route, alternated with a compact mica slate.

Along the Sweet Water, many interesting plants were collected, as may be seen by an examination of the catalogue; I would, however, mention the curious *Oenothera Nuttallii*, Torr. and Gr.; *Eurotia lanata*, Mocq. (*Diotis lanata*, Pursh), which seems to be distinct from *E. ceratoides*; *Thermopsis montana*, Nutt.; *Gilia pulchella*, Dougl.; *Senecio spartioides*, Torr. and Gr., a new species, and four or five species of wild currants (*Ribes triguum*, Dougl., &c.) Near the mouth of the Sweet Water was found the *Plantago eriophora*, Torr., a species first described in my Dr. James's Rocky Mountain Plants. On the upper part, and near the dividing ridge, were collected several species of *Castilleja*; *Pentstemon micrantha*, Nutt.; several *Genians*; the pretty little *Androsace occidentalis*, Nutt.; *Solidago incana*, Torr. and Gr.; and two species of *Eriogonum*, one of which was new.

On the 8th of August, the exploring party crossed the dividing ridge or pass, and found the soil of the plains at the foot of the mountains on the western side to be sandy. From Laramie's fork to this point, different species of *Artemisia* were the prevailing and characteristic plants; occupying the place of the grasses, and filling the air with the odor of camphor and turpentine. Along Little Sandy, a tributary of the Colorado of the West, were collected a new species of *Phaca* (*P. digitata*), and *Parnassia fimbriata*.

On the morning of the 10th of August, they entered the defiles of the Wind River mountains, a spur of the Rocky Mountains or Northern Andes, and among which, they spent about eight days. On the borders of a lake, embosomed in one of the defiles, were collected *Sedum Rhodiola*, DC. (which had been found before, south of Kotzebue's Sound, only by Dr. James); *Senecio hydrophilus*, Nutt.; *Vaccinium uliginosum*; *Betula glandulosa*, and *B. occidentalis*, Hook.; *Elaeagnus argentea*, and *Shepherdia Canadensis*. Some of the higher peaks of the Wind River mountains rise 1,000 feet, above the limits of perpetual snow. Lieut. Fremont, attended by four of his men, ascended one of the loftiest peaks on the 15th of August. On this he found the snow line 12,500 feet above the level of the sea. The vegetation of the mountains is truly Alpine, embracing a considerable number of species common to both hemispheres, as well as some that are peculiar to North America. Of the former, Lieut. Fremont collected *Phleum alpinum*; *Oxyria reniformis*; *Veronica alpina*; several species of *Salix*; *Carex atrata*; *C. penicea*; and, immediately below the line of perpetual congelation, *Silene acaulis* and *Polemonium caeruleum*, β Hook. Among the alpine plants peculiar to the western hemisphere, there were found *Orophila myrtifolia*, Nutt.; *Aquilegia carulea*, Torr.; *Pedicularis surrecta*, Benth.; *Pulmonaria ciliata*, James; *Silene Drummondii*, Hook.; *Menziesia empetrifolia*, *Potentilla gracilis*, Dougl.; several species of *Pinus*; *Fraxina speciosa*, Hook.; *Dodecatheon dentatum*, Hook.; *Phlox muscoides*, Nutt.; *Senecio Fremontii*, n. sp., Torr. and Gr.; four or five *Asters*, and *Vaccinium myrtilloides*, Mx.; the last seven or eight, very near the snow line. Lower down the mountain were found *Arnica*

angustifolia, Torr. and Gr.

The expedition followed the same route for a great length of time.

As the plants of North America were inserted in the report to the Repository, it was necessary to add the names of the writers of the

New York

angustifolia, Vahl; *Senecio triangularis*, Hook.; *S. subnudus*, DC.; *Macrorhynchus troximoides*, Torr. and Gr.; *Helianthella uniflora*, Torr. and Gr., and *Linosyris viscidiflora*, Hook.

The expedition left the Wind River mountains about the 18th of August, returning by the same route as that by which it ascended, except that it continued its course through the whole length of the Lower Platte, arriving at its junction with the Missouri on the 1st of October.

As the plants of Lieut. Fremont were under examination while the last part of the Flora of North America was in the press, nearly all the new matter relating to the Compositae was inserted in that work. Descriptions of a few of the new species were necessarily omitted, owing to the Report of the Expedition having been called for by Congress before I could finish the necessary analyses and comparisons. These, however, will be inserted in the successive numbers of the work to which I have just alluded.

JOHN TORREY.

New York, March, 1843.

Clematis
Ranunc
R. Cym
Aquileg
Actaea r
Thalictr
T. mega

Menisperm

Berberis

Argemone

Nasturtium
Erysimu
E. aspera
Pachypod
Septaria
Vesicaria
July 3
Braya n.
Lepidium

Cleome
July 9
Potamogeton

Polygala

Parnassia

Artemisia
Silene Dr
S. acutifolia

CATALOGUE OF PLANTS.

CLASS I.—EXOGENOUS PLANTS.

RANUNCULACEÆ.

- Clematis Virginiana* (Linn.) Valley of the Platte. June, July.
Ranunculus sceleratus (Linn.) Valley of the Sweet Water river. August 18-20.
R. Cymbalaria (Pursh.) Upper Platte. July 31, August.
Aquilegiaerulea (Torr.) Wind River mountains. August 13-16.
Actea rubra (Bigel.) Upper Platte. August 26-31.
Thalictrum Cornuti (Linn.) Platte.
T. megacarpum, n. sp. Upper Platte. August 26-31.

MENISPERMACEÆ.

- Menispermum Canadense* (Linn.) Leaves only. On the Platte.

BERBERIDACEÆ.

- Berberis Aquifolium* (Torr. and Gr.) Wind River mountains. August 13-16.

PAPAVERACEÆ.

- Argemone Mexicana* β *albiflora* (DC.) Forks of the Platte. July 2.

CRUCIFERÆ.

- Nasturtium palustre* (DC.) Black Hills of the Platte. July 26-August.
Erysimum cheiranthoides (Linn.) Black Hills. July 23.
E. asperum (Nutt.) South fork of the Platte. July 4.
Pachypodium (Thelypodium, Endl. gen. p. 676,) *integrifolium* (Nutt.) North fork of the Platte. September 4. Var. with longer pods. With the preceding.
Vesicaria didymocarpa (Hook.) Leaves only. North fork of the Platte, above the Red Buttes. July 30.
Braya n. sp. Wind River mountains, near the limits of perpetual snow. August 15.
Lepidium rudemale (Linn.) On the Platte. June 29.

CAPPARIDACEÆ.

- Cleome integrifolia* (Torr. and Gr.) From the Lower Platte nearly to the mountains. June 29, July 2, Aug. 21.
Polemonia trachysperma, β (Torr. and Gr.) Black Hills of the Platte. July 23.

POLYGALACEÆ.

- Polygala alba* (Nutt.) P. Beyrichii, (Torr. and Gr.) Forks of the Platte. July 2.

DROSERACEÆ.

- Fernandea fimbriata* (Banks.) Little Sandy creek, defiles of the Wind River mountains. Aug. 8.

CARYOPHYLLACEÆ.

- Silene congesta* (Nutt.) Highest parts of the Wind River mountains. Aug. 13-16.
Silene Drummondii (Hook.) With the preceding.
S. acutis (Linn.) Wind River mountains, at the limits of perpetual snow.

PORTULACACEÆ.

Talinum parviflorum (Nutt.) Little Blue river of the Kansas. June 26.

LINACEÆ.

Linum rigidum (Pursh.) North fork of the Platte. July 8.

L. perenne (Linn.) Black Hills to the Sweet Water of the Platte. Aug. 9-31.

GERANIACEÆ.

Geranium Fremonii, n. sp. Black Hills. Aug. 26-31.

OXALIDACEÆ.

Oxalis stricta (Linn.) On the Kansas. June.

ANACARDIACEÆ.

Rhus trilobata (Nutt.) Red Buttes. July 29.

MALVACEÆ.

Malva pedata (Torr. and Gr.) Big Blue river of the Kansas. June 21.

M. involucrata (Torr. and Gr.) Little Blue river of the Kansas. June 23.

Sida coccinea (DC.) Little Blue river to the South fork of the Platte. June 22-July 4.

VITACEÆ.

Vitis riparia (Michx.) Grand Island of the Platte. Sept. 19.

ACERACEÆ.

Nyctanda aceroides (Mench.) On the lower part of the Platte.

CELASTRACEÆ.

Oreophila myrtifolia (Nutt.) Summit of the Wind River mountains. Aug. 13-14.

RHAMNACEÆ.

Ceanothus velutinus (Dougl.) With the preceding.

C. americanus, var. *sanguineus*. *C. sanguineus* (Pursh.) On the Platte.

C. mollissimus, n. sp. Near the Kansas river. June 19.

LEGUMINOSÆ.

Lathyrus linearis (Nutt.) On the Platte, from its confluence with the Missouri, to Fort Laramie. Sept. 2-30.

Amphicarpaea monoica (Torr. and Gr.) North fork of the Platte. Sept. 4.

Apocynum tuberosum (Mench.) Forks of the Platte. Sept. 13.

Glycyrrhiza lepidota (Pursh.) From near the Kansas river to the Black Hills of the Platte. June 21-July 25.

Psoralea floribunda (Nutt.) Forks of the Platte. July 9.

P. campestris (Nutt.?) and a more glabrous variety. With the preceding. July 2.

P. lanceolata (Pursh.) Black Hills of the Platte. July 24.

P. argophylla (Pursh.) Little Blue river. June 23.

P. tenuiflora, (Pursh.) (no flowers). Forks of the Platte. Sept. 12.

Petalostemon violaceum (Michx.) Big Blue river of the Kansas, &c. June 21.

P. candidum (Michx.) Red Buttes. July 29.

Amorpha fruticosa (Linn.) From the Lower Platte to the mountains. Aug. 8-Sept. 19.

A. canescens (Nutt.) Kansas and Lower Platte rivers. June 19-Sept. 20.

Lepedeza capitata (Michx.) Mouth of the Platte. Sept. 30.

Desmodium acuminatum (DC.) Little Blue river of the Kansas. June 22.

Astragalus

A. mollis

A. hypog

Oxytropis

20-July

O. platensis

Phaca astr

P. elegans

P. (Oroph)

P. longifolia

Xanthoxylum

Lupinus

4-21.

L. ornatus

Baptisia

Thermopsis

Cassia chamaecrista

Schrankia

Darlingtonia

- Astragalus gracilis* (Nutt.) Forks of the Platte. July 2.
A. mollissimus (Torr.) Valley of the Platte. June 23.
A. hypoglottis (Linn.) Sweet Water of the Platte. Aug. 5.
Oxytropis Lambertii (Pursh.) Big Blue river of the Kansas to the forks of the Platte. June 20-July 2.
O. Platanus (Nutt.?) (no flowers). Goat island of the Upper Platte. July 31.
Phaca astragalina (DC.) Highest summit of the Wind River mountain. Aug. 15.
P. elegans (Hook.) var.? Goat island of the Upper Platte. July 31.
P. (Orophaca) digitata, n. sp. Little Sandy river. Aug. 8.
P. longifolia (Nutt.) (leaves only). Wind River mountains. Aug. 12-17.
Nentrophylla montana (Nutt.) Laramie river to the Sweet Water. July 14-Aug. 4.
Lupinus leucophyllus (Lindl.) Wind River mountains, and Sweet Water of the Platte. Aug. 4-21.
L. ornatus (Dougl.) *L. leucopis* (Agardh.) With the preceding.
Baptisia leucantha, (Torr. and Gr.) Kansas river.
Thermopsis montana (Nutt.) Sweet Water river. Aug. 5.
Cassia chamaecrista (Linn.) Mouth of the Platte. Sept. 30.
Schrankia uncinata (Willd.) Kansas and Platte rivers. June 12-Sept.
Darlingtonia brachypoda (DC.) On the Platte. Sept. 17.

ROSACEÆ.

- Cerasus Virginiana* (Torr. and Gr.) Upper North fork of the Platte. July 20.
Cercocarpus parvifolius (Nutt.) Bitter creek, North fork of the Platte. July 22.
Purshia tridentata (DC.) Sweet Water river, &c. Aug. 12-Sept.
Grum Virginianum (Linn.) Kansas river. June 20.
Sibbaldia procumbens (Linn.) Wind River mountains, near perpetual snow. Aug. 12-14.
Potentilla gracilis (Dougl.) With the preceding.
P. diversifolia (Lehm.) Sweet Water of the Platte to the mountains. Aug. 4-15.
P. sericea β. *glabrata* (Lehm.) With the preceding.
P. fruticosa (Linn.) With the preceding.
P. Anserina (Linn.) Black Hills of the Platte. July 26-31.
P. arguta (Pursh.) Little Blue river of the Kansas, and Black Hills of the Platte. June 22-Aug. 28.
Rubus strigosus (Michx.) Defiles of the Wind River mountains. Aug. 12-17.
Amelanchier diversifolia, var. *alnifolia*, (Torr. and Gr.) Sweet Water of the Platte. Aug. 5.
Rosa blanda (Alt.) Lower Platte.
R. foliolosa (Nutt.) var. *lelocarpa*. With the preceding.

ONAGRACEÆ.

- Epilobium coloratum* (Muhl.) Black Hills of the Platte to the Sweet Water river. Aug. 4-31.
E. spicatum (Lam.) From the Red Buttes to the Wind River mountains. Aug. 12-31.
Oenothera albicaulis (Nutt.) North fork of the Platte. July 14.
O. Missouriensis (Sims.) Big Blue river of the Kansas. June 12-20.
O. trichocalyx (Nutt.) North fork of the Platte. July 30.
O. serrulata (Nutt.) On the Kansas and Platte. June-July 14.
O. rhombipetala (Nutt.) On the Platte. September 12-20.
O. biennis (Linn.) Black Hills to the Sweet Water River. July 22-August 4.
O. (Taraxia) Nuttallii (Torr. and Gr.) Upper part of the Sweet Water.
O. speciosa (Nutt.) Big Blue river of the Kansas. June 12-20.
O. Drummondii (Hook.?) Black Hills. July 26.
Gaura coccinea (Nutt.) Var.? Little Blue River of the Kansas, and south fork of the Platte June 26-July 4.

LOASACEÆ.

Monticola nuda (Torr. and Gr.) North fork of the Platte. July 14.

GROSSULACEÆ.

Ribes cereum (Lindl.) Sweet Water of the Platte. August 3-4.

R. lacustre (Poir.) With the preceding. β . leaves deeply lobed. *R. echinatum* (Doug.) Perhaps a distinct species.

R. irriguum (Doug.) With the preceding.

CACTACEÆ.

Opuntia Missouriensis (DC.) Forks of the Platte. July 2.

CRASSULACEÆ.

Sedum Rhodiola (DC.) On a lake in Wind River mountains. August 12-17.

UMBELLIFERÆ.

Heraclium lanatum (Michx.) Leaves only. The leaves are more glabrous than in the ordinary form of the plant. Alpine region of the Wind River mountains.

Polypodium Nuttallii (DC.) On the Kansas. June 20.

Nium ? lacinum, n. sp. Stem sulcate; segments of the leaves distant, deeply incised or pinnatifid; the lower teeth or divisions often elongated and linear.—North fork of the Platte. July 19.

Edoemia Gairdneri (Torr. and Gr.) Without fruit.

Cleista maculata (Linn.) Lower Platte.

Musenium tenuifolium (Nutt.) Alpine region of the Wind River mountains.

CORNACEÆ.

Cornus stolonifera (Michx.) On a lake in the Wind River mountains. August 12-17.

C. circinata (L'Her.) On the Platte.

CAPRIFOLIACEÆ.

Symphoricarpos occidentalis (R. Brown.) North fork of the Platte. July 10—Aug. 31.

S. vulgaris (Michx.) Deñles of the Wind River mountains. August 13-14.

RUBIACEÆ.

Galium boreale (Linn.) Upper part of the north fork of the Platte. Aug. 12-31.

COMPOSITEÆ.

Vernonia fasciculata (Michx.) On the Platte.

Astris scariosa (Willd.) Lower part of the Platte. Sept. 37.

L. spicata (Willd.) North fork of the Platte. Sept. 4.

L. squarrosa, var. *intermedia* (DC.) A small form of the plant. On the Platte.

L. punctata (Hook.) Black Hills of the Platte. Aug. 29.

Brickellia grandiflora (Nutt.) North fork of the Platte.

Aster integrifolius (Nutt.) Base of the Wind River mountains.

A. adscendens (Lindl.) Wind River Mountains. Var. *Fremontii*. With the preceding, the highest summits to the limits of perpetual snow. Aug. 16.

A. laevis (Linn.) North fork of the Platte.

A. Novi-Belgii (Linn.) Sweet Water of the Platte. Aug. 22.

A. cordifolius (Linn.) Lower Platte.

A. multiflorus, β . (Torr. and Gr.) Upper Platte, &c.

A. falcatus (Lindl.) Black Hills to the Sweet Water. July 33—Aug.

A. laxifolius (Nees.) On the Platte, from its mouth to the forks. Sept. 12-30.

A. elongatus
A. Novae-Scotiae
A. Indianus
A. glacialis
A. subargutus
A. ciliatus
A. glaucus
Dietrichia viscosa
D. coronopifolia
D. pulcherrima
Erigeron Canadensis
E. of Septem
E. Bellidifolia
E. macranthus
E. glabellum
E. strigosum
Gutierrezia
Solidago rigida
S. Missouriensis
S. speciosa
S. Virga-aurea
S. incana
S. gigantea
Linopappus gracilis
L. viridiflora
Chrysopsis hispida
C. mollis
Trifolium axillaris
Franseria discolor
Lepachys colorata
Balsamorhiza
Helianthus petiolaris
H. Maximiliani
Helianthella
Coreopsis tinctoria
Comidium gracile
Bidens connata
Hymenopappus
Actinella grandiflora
Achillea Millefolium
Artemisia biennis
A. cana
A. tridentata
A. filifolia
A. Canadensis
A. Ludoviciana
A. frigida
A. Lewisii
Stephanomeria

- A. oblongifolius* (Nutt.) Lower Platte, &c.
A. Juncus-Anglica (Linn.) Lower Platte to the Wind River mountains. Aug. 19—Sept. 21.
A. Andinus (Nutt.) Near the snow line of the Wind River mountains. Aug. 16.
A. glacialis (Nutt.) With the preceding.
A. subuliginosus (Richards.) With the preceding.
A. elegans (Torr. and Gr.) Wind River mountains.
A. glaucus (Torr. and Gr.) With the preceding.
Dactylis viscosa (Nutt.) On the Platte.
D. coronopifolia (Nutt.) With the preceding.
D. pulcherrima (Nutt.) Near *D. semilifera*. With the preceding.
Erigeron Canadensis (Linn.) On the Platte, from near its mouth to the Red Buttes. Latter part of September to July 30.
E. Bellidiflorum (Nutt.) On the Platte.
E. macranthum (Nutt.) With the preceding.
E. glabellum (Nutt.) With the preceding.
E. strigosum (Muhl.) With the preceding.
Gutierrezia Euthamia (Torr. and Gr.) Laramie river, upper north fork of the Platte. Sept. 2.
Solidago rigida (Linn.) North fork of the Platte.
S. Minnouriensis (Nutt.) Fort Laramie, north fork of the Platte. July 22, to the mountains.
S. speciosa (Nutt.) Upper Platte.
S. Virga-aurea (Linn.) var. *multiradiata*, (Torr. and Gr.) Wind River mountain, from the height of 7,000 feet, to perpetual snow.
S. incana (Torr. and Gr.) Sweet Water river.
S. gigantea (Linn.) var. β . From the Platte to the mountains.
Linogyne graveolens (Torr. and Gr.) Sweet Water river. Aug. 30
L. viridiflora (Hook.) Upper Platte.
Aplopappus spinulosus (DC.) Fort Laramie, north fork of the Platte. Sept. 3.
Grindelia squarrosa (Dunal). Upper north fork of the Platte, and on the Sweet Water. July 22—Aug. 21.
Corynopsis hispida (Hook.) On the Platte.
C. mollis (Nutt.) With the preceding. Too near *C. foliosa*, (Nutt.)
C. axillaris (Pursh). Sweet Water river. Aug. 3.
Franseria discolor (Nutt.) Near the Wind River mountains.
Lepachys columnaris (Torr. and Gr.) Little Blue river of the Kansas. June 26.
Balanorrhiza angulata (Nutt.) Wind River mountains.
Helianthus petiolaris (Nutt.) Black Hills of the Platte. July 26.
H. Maximiliani (Sched.) With the preceding.
Helianthella uniflora (Torr. and Gr.) Wind River mountains.
Coreopsis tinctoria (Nutt.) On the Platte.
Cosmidium gracile (Torr. and Gr.) Upper Platte.
Bidens connata (Muhl.) With the preceding.
Hymenopappus corymbosus (Torr. and Gr.) With the preceding.
Actinella grandiflora (Torr. and Gr.) n. sp. Wind River mountains.
Achillea Millefolium (Linn.) *A. lanosa*. (Nutt.) Upper Platte to the mountains.
Artemisia biennis (Willd.) On the Platte.
A. cana (Pursh). Without flowers. With the preceding.
A. tridentata (Nutt.) On the Sweet Water, near the mountains.
A. filifolia (Torr.) South fork of the Platte, and north fork, to Laramie river. July 4—Sept. 3.
A. Canadensis (Michx.) With the preceding.
A. Ludoviciana, (Nutt.) Black Hills of the Platte. July 26.
A. frigida (Willd.) Black Hills to the mountains.
A. Lewisii (Torr. and Gr.?) No flowers. On the Platte.
Stephanomeria runcinata (Nutt.) Upper Platte.

- Gnaphalium uliginosum*, (Linn.) Var. *foliis angustioribus*. Sweet Water river.
G. pulsatre (Nutt.) β . (Torr. and Gr.) With the preceding.
Arrisia angustifolia (Vahl.) *A. fulgens*, (Pursh). Defiles of the Wind River mountains, from 7,000 feet and upwards. August 13-14.
Suaeda triangularis (Hook.) β . (Torr. and Gr.) With the preceding.
S. subnudus (DC.) With the preceding.
S. Fremontii (Torr. and Gr.) n. sp. Highest parts of the mountains, to the region of perpetual snow. Aug. 15.
S. raphifolius (Nutt.) North fork of the Platte and Sweet Water.
S. lanecolatus (Torr. and Gr.) n. sp. With the preceding.
S. hydrophilus (Nutt.) On a lake in the Wind River mountains. Aug. 12-17.
S. spartioides (Torr. and Gr.) n. sp. Sweet Water river. Aug. 21.
Cacalia tuberosa (Nutt.) Upper Platte.
S. Alifolius (Nutt.) β . *Fremontii*, (Torr. and Gr.) Lower Platte.
Tetradymia inermis (Nutt.) Sweet Water river, from its mouth to the highest parts of the Wind River mountains.
Cirsium altissimum (Spreng.) Lower Platte.
Crepis glauca (Hook.) Upper Platte.
Macrorhynchus (Stylopeppus) troximoides (Torr. and Gr.) Defiles of the Wind River mountains. Aug. 13-14.
Mulgedium pulchellum (Torr. and Gr.) Black Hills of the Platte. July 25-31.
Lygodesmia juncea (Don.) Upper Platte.
Troximon parviflorum (Nutt.) Sweet Water river, near the mountains.

LOBELIACEÆ.

- Lobelia spicata* (Lam.) On the Lower Platte. June 28.
L. siphilitica (Linn.) North fork of the Platte. Sept. 4.

CAMPANULACEÆ.

- Campanula rotundifolia* (Linn.) Lower Platte.
Specularia perfoliata (DC.) Little Blue river of the Kansas.

ERICACEÆ.

- Phyllocladus empetrifolia* (D. Don). Defiles of the Wind River mountains. Aug. 13-16.
Vaccinium myrtilloides (Hook.) Wind River mountains, in the vicinity of perpetual snow. Aug. 15.
V. uliginosum (Linn.) With the preceding.
Artostaphylos Uva-ursi (Spreng.) On a lake in the mountains. Aug. 12-17.

PRIMULACEÆ.

- Dodecatheon dentatum* (Hook.) Defiles of the Wind River mountains. Aug. 13-16.
Androsace occidentalis (Nutt.) Sweet Water river. Aug. 5.
Lysimachia ciliata (Linn.) Forks of the Platte. July 2.
Glauz maritima (Linn.) Upper North fork of the Platte. July 31.

SCROPHULARIACEÆ.

- Orthocarpus luteus* (Nutt.) Sweet Water river. Aug. 5.
Mimulus alsinoides (Benth.) Defiles of the Wind River mountains. Aug. 13-16.
M. Lewisii (Pursh). With the preceding.
Castilleja pallida (Kunth). Sweet Water river. Aug. 8.
C. miniata (Benth.) Wind River mountains. Aug. 13-16. There are two or three other species of this genus in the collection, which I have not been able to determine.
Veronica alpina β . (Hook.) Alpine region of the Wind River mountains.
Pentstemon albidus (Nutt.) Forks of the Platte. July 2.
P. caruleus (Nutt.) South fork of the Platte. July 4.

P. mianth
Pedicularis
Gerardia

Orebanche

Monarda

Teucrium

Lyceus

Stachys

Scutellaria

Mentha

Salvia

Lippia

fork of the

Verbena

V. hastata

V. bracteata

Pulmonaria

mountains

Onosmodium

Balschia

Myosotis

Eutoca

Phacelia

racemes

July 30.

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mountains.

P. Hoodii

P. pilosa

Polemonium

(Hook.)

Gilia

G. pulchella

G. inconspicua

from the O

- P. microanthum* (Nutt.) Sources of the Sweet Water, near the mountains. Aug. 7.
Pedicularis surrecta (Benth.) Defiles of the Wind River mountains. Aug. 13-16.
Gerardia longifolia (Nutt.) Lower Platte. July 22.

OROBANCHACEÆ.

- Orobancha fasciculata* (Nutt.) South fork of the Platte. July 4.

LABIATÆ.

- Monarda fistulosa* (Linn.) On the Platte.
Tricrurum Canadense (Linn.) With the preceding.
Lycopus sinuatus (Ell.) With the preceding.
Stachys aspera (Michx.) Forks of the Platte. July 2.
Scutellaria galericulata (Linn.) North fork of the Platte. July 10.
Mentha Canadensis (Linn.) With the preceding.
Salvia azurea (Lam.) Kansas river and forks of the Platte. June 19-29, July 2.

VERBENACEÆ.

- Lippia cuneifolia*, *Zapania cuneifolia* (Torr. in ann. Lyc. Nat. Hist. N. York, 2. p. 234.) N. fork of the Platte. July 12.
Verbena stricta (Vent.) With the preceding.
V. hastata (Linn.) With the preceding.
V. bracteata (Michx.) With the preceding.

BORAGINACEÆ.

- Pulmonaria ciliata* (James; Torr. in ann. Lyc. N. York, 2. p. 224.) Defiles in the Wind River mountains. Aug. 13-15.
Onosmodium molle (Michx.) On the Platte. June 29.
Balschia Gmelini Michx.) Little Blue river of the Kansas. June 22.
Nyctotis glomerata (Nutt.) Forks of the Platte. July 2.

HYDROPHYLLACEÆ.

- Euloca sericea* (Lehm.) Wind River mountains!
Phacelia leucophylla, n. sp. Whole plant strigosely canescent; leaves elliptical, petiolate entire; racemes numerous, scorpioid, densely flowered.—Goat Island, upper North fork of the Platte. July 30. Perennial.—Stems branching from the base. Leaves about two inches long, and 6-8 lines wide; radical and lower cauline ones on long petioles; the others nearly sessile. Spikes forming a terminal crowded sort of panicle. Flowers sessile, about 3 lines long. Sepals strongly hispid. Corolla one third longer than the calyx; the lobes short and entire. Stamens much exserted; filaments glabrous. Style 2-parted to the middle, the lower part hairy. Ovary hispid, incompletely 2-celled, with 2 ovules in each cell. Capsule, by abortion, one seeded; seed oblong, strongly punctate. Nearly related to *P. integrifolia* (Torr.); but differs in the leaves being perfectly entire, the more numerous spikes, one-seeded capsules, as well as in the whitish strigose pubescence of the whole plant.

POLEMONIACEÆ.

- Phlox muscoides* (Nutt.) Immediately below the region of perpetual snow, on the Wind River mountains. Aug. 15.
P. Hoodii (Richards.) North fork of the Platte. July 8.
P. pilosa (Nutt.) Big Blue river of the Kansas. June 20.
Polemonium caeruleum (Linn., Hook.) Red Buttes on the Upper N. fork of the Platte. β humile (Hook.) Highest parts of the mountains, near perpetual snow. Aug. 13-15.
Gilia (*Cantua*) *longiflora* (Torr.) Sand Hills of the Platte. Sept. 16.
G. pulchella (Dougl.) Upper part of the Sweet Water near the mountains. Aug. 7-20.
G. inconspicua (Dougl.?) Goat Island, upper N. fork of the Platte. July 30. This differs from the Oregon plant in its fleshy, simply pinnatifid leaves, with ovate, obtuse segments.

CONVOLVULACEÆ.

Calystegia sepium (R. Br.) Forks of the Platte. July 2.

Sponema leptophylla, n. sp. Stems branching from the base, prostrate, glabrous, angular; leaves lanceolate-linear, very acute, entire, attenuate at the base into a petiole; peduncles 1-3-flowered; sepals roundish-ovate, obtuse with a minute mucro.—Forks of the Platte to Laramie river, July 4–Sept. 3. Imperfect specimens of this plant were collected about the sources of the Canadian, by Dr. James, in Long's expedition, but they were not described in my account of his plants. The root, according to Dr. James, is annual, producing numerous thick prostrate, but not twining, stems, which are two feet or more in length. The leaves are from two to four inches long, acute at each end, strongly veined and somewhat coriaceous. Peduncles an inch or more in length, those towards the extremity of the branches only 1-flowered; the lower ones bearing 2-3, and sometimes 4, flowers, which are nearly the size of those of *Calystegia sepium*, and of a purplish color. Sepals appressed, about five lines long. Corolla campanulate—funnel form, the tube much longer than the calyx. Stamens inserted near the base of the corolla; filaments villous at the base; anthers oblong-linear, large. Style as long as the stamens; stigma 2-lobed; the lobes capitate. Ovary 2-celled, with two ovules in each cell.

SOLANACEÆ.

Nycterium luteum (Donn cat.) South fork of the Platte. July 4.

Physalis pubescens (Willd.) Upper North fork of the Platte. July 23.

P. pumila (Nutt.) With the preceding.

GENTIANACEÆ.

Gentiana arcophila β *densiflora* (Griseb.) In Hook. fl. Bor.—Am. 2. p. 61.) Sweet Water of the Platte. Aug. 4.

G. affinis (Griseb.) North fork of the Platte. Sept. 9.

G. Pneumonanthe (Linn.) Laramie river to Little Sandy creek in the mountains. July 12–Aug. 8.

G. Fremontii, n. sp. Stem branched at the base; branches 1-flowered; leaves ovate, cuspidate, cartilaginous on the margin, erect; corolla funnel-form; plicæ small, slightly 2-toothed; capsule ovate, at length entirely exserted on its thick stipe.—Wind River mountains.—Annual. Branches several, 2-3 inches long, of nearly equal length. Leaves about three lines long, with a strong whitish cartilaginous border, shorter than the internodes. Flowers as large as those of *G. prostrata*, pentamerous. Calyx two-thirds the length of the corolla; the teeth about one-third the length of the tube. Plicæ of the corolla scarcely one-third as long as the lanceolate lobes. Stamens included; anthers oblong, somewhat cordate at the base. Capsule in maturity, and after dehiscence (in which state all our specimens were collected), exserted quite beyond the corolla, and, with its long stipe, resembling a style with a large bilamellate stigma. None of the capsules contained any seeds. This species is nearly related to *G. prostrata* (Haenk.) and *G. humilis* (Stev.), but the former has spatulate obtuse recurved leaves, and the latter entire plicæ, which are nearly the length of the corolla. In *G. humilis*, and in the allied *G. squarrosa* (Ledeb.) the capsule is exserted after discharging the seeds.

Svertia perennis, β *obtusata* (Hook.) From Laramie river to the Big Buttes.

Fraxera speciosa, (Hook.) Defiles of the Wind River mountains. Aug. 13-14.

Lisianthus Russelianus (Hook.) Lower Platte to the Forks. July–Sept.

APOCYNACEÆ.

Apocynum cannabinum (Linn.) On the Platte.

ASCLEPIADACEÆ.

Asclepias speciosa (Torr., in ann. Lyc. N. York, 2. p. 218.—A. Douglasii, Hook. fl. Bor.—Am. 2. p. 53. t. 142.) Forks of the Platte. July 2. Collected also by Mr. Nicolle in his North-

western exp.
collected by
vericillata (L.
tuberosa (Lin.
menthoris viri
cerates longifo
angustifolius

razinus platyc

leningo eriopoc
gnaphaloides

henopodium zoo
Album (Linn

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the Platte.

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Sept. 4.

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(Nutt.) Kan

western expedition. Hooker's plant differs in no essential characters from my *A. speciosa*, collected by Dr. James in Long's first expedition.

A. verticillata (Linn.) Small var. etc. With the preceding.

A. tuberosa (Linn.) Kansas river. June 19.

Santherix viridis (Nutt.) Big Blue river of the Kansas. June 20.

Gerardia longifolia (Ell.) *Polyotus longifolia*. (Nutt.) With the preceding.

A. angustifolius. *Polyotus angustifolius*. (Nutt.) With the preceding.

OLEACEÆ.

Fraxinus platycarpa (Michx.) Leaves only. Lower Platte.

PLANTAGINACEÆ.

Plantago eriopoda (Torr. in ann. Lyc. N. York, 2, p. 237.) Mouth of the Sweet Water. July 31.

Gnaphaloides (Nutt.) Little Blue river of the Kansas. June 24.

CHENOPODIACEÆ.

Chenopodium zosterifolium (Hook.) Platte?

A. Album (Linn.) North fork of the Platte. July 19.

Atriplex canescens (Mocq. Chenop. p. 74.) *Atriplex canescens*. (Nutt.) Upper north fork of the Platte. July 26.

Crotonoma platyphylla (Mocq. l. c. p. 18.) *Kochia dentata*, (Willd.) North fork of the Platte. Sept. 4.

Suaeda maritima (Mocq. l. c. p. 197.) With the preceding.

Diplotis lanata (Mocq. l. c. p. 81.) *Diplotis lanata*, (Pursh.) Red Buttes to the mountains. Aug. 18-25.

Fremontia, n. gen. Flowers diclinous, monœcious &? dioecious, heteromorphous. Stam. Fl. in terminal aments. Scales excentrically peltate, on a short stipe, angular, somewhat cuspidate upward. Stamens 2-3-4 under each scale, naked, sessile; anthers oblong. Pist. Fl. solitary, axillary. Perigonium closely adhering to the lower half of the ovary, the border entire, nearly obsolete, but in fruit enlarging into a broad horizontal angular and undulate wing. Ovary ovate; styles thick, divaricate; stigmas linear. Fruit a utricle, the lower two-thirds covered with the indurated calyx, compressed. Seed vertical; integument double. Embryo flat-spiral (2-3 turns) green; radicle inferior; albumen none.

Batis vermicularis. *Batis vermicularis*, (Hook.) Fl. Bor. Amer. 2. p. 128. Upper north fork of the Platte, near the mouth of the Sweet Water. July 30. A low, glabrous, diffusely branched shrub, clothed with a whitish bark. Leaves alternate, linear, fleshy and almost semiterete, 6-12 lines long and 1-2 lines wide. Staminate aments about three-fourths of an inch long, cylindrical, at first dense, and composed of closely compacted angular scales, covering naked anthers. Anthers very deciduous. Fertile flowers in the axils of the rameal leaves. Calyx closely adherent, and at first with only an obscure border or limb, but at length forming a wing 3-4 lines in diameter, resembling that of *Salsola*. This remarkable plant, which I dedicate to Lieutenant Fremont, was first collected by Dr. James about the sources of the Canadian, (in Long's expedition) but it was omitted in my account of his plants published in the Annals of the Lyceum of Natural History. It is undoubtedly the *Batis vermicularis* of Hooker, (l. c.) collected on the barren grounds of the Oregon river by the late Mr. Douglas, who found it with only the staminate flowers. We have it now from a third locality, so that the plant must be widely diffused in the barren regions towards the Rocky Mountains. It belongs to the sub-order *Spirolobæ* of Meyer and Mocquin, but can hardly be referred to either the tribe *Suaedineæ* or to *Salsolæ*, differing from both in its diclinous heteromorphous flowers, and also from the latter in its flat-spiral, not cochleate embryo.

NYCTAGINACEÆ.

Nyctagaphis nyctaginea (Torr. in James' Rocky mountain plants.)=*Calymenia nyctaginea* (Nutt.) Kansas river, June 20.

Abronia mollifera (Dougl.) North fork of the Platte, July 7-12.

3. (*Tripterocalyx*) *micranthum*, n. sp. Viscid and glandularly pubescent; leaves ovate, undulate, obtuse, acute at the base, petiolate; perianth funnel form, 4-lobed at the summit, 3-4-angled; achenium broadly 3-winged.—Near the mouth of Sweet Water river. Aug. 1. Annual. Stem diffusely branched from the base, beginning to flower when only an inch high; the branches of the mature plant above a foot long. Leaves 1-1½ inch in length; petioles about as long as the lamina. Heads axillary. Involucre 5-leaved, 8-14-flowered; leaflets ovate, acuminate. Perianth colored (purplish) 3-4 lines long; lobes semi-ovate, obtuse. Stamens inserted in the middle of the tube, unequal; anthers ovate, sagittate at the base. Ovary oblong, clothed with the 3-winged base of the calyx; style filiform; stigma filiform-clavate, incurved. Mature achenium about 7 lines long and 4 wide; the wings broad, nearly equal, membranaceous and strongly reticulated. Seed oblong. Embryo conduplicate, involving the deeply 2-parted mealy albumen; radicle linear-terete; inner cotyledon abortive! outer one oblong, foliaceous, concave, as long as the radicle. This interesting plant differs from its congeners in its funnel-form perianth, 3-4-angled flowers, and broadly 3-winged fruit, but I have not been able to compare it critically with other species of *Abronia*. It may prove to be a distinct genus.

POLYGONACEÆ.

Polygonum Persicaria (Linn.) North fork of the Platte. Sept. 4.

P. aviculare (Linn.) With the preceding.

P. amphibium (Linn.) Sweet Water river. August 4.

P. viviparum (Linn.) Black Hills. July 26.

Rumex salicifolius (Weinn.) With the preceding.

Oxyria reniformis (Hill.) Alpine region of the Wind River mountains. August 13-16.

Eriogonum ovalifolium (Nutt.) Horse-shoe creek, upper north fork of the Platte. July 22.

E. caespitosum (Nutt.) With the preceding.

E. umbellatum (Torr.) In ann. Lyc. Nat. Hist. N. York, 2, p. 241. Sweet Water river, Aug. 7.

E. Fremontii, n. sp. With the preceding.

E. annuum (Nutt.) North fork of the Platte. September 4.

ELEAGNACEÆ.

Shepherdia argentea (Nutt.) "Grains de beau." Upper north fork of the Platte, from the Red Buttes to the mouth of the Sweet Water. Aug. 24-28.

S. Canadensis (Nutt.) On a lake in the Wind River mountains. August 12-17.

Eleagnus argenteus (Pursh.) With the preceding.

EUPHORBACEÆ.

Euphorbia marginata (Pursh.) Forks of the Platte. September 11.

E. polygonifolia (Linn.) South Fork of the Platte. July 4.

E. corollata (Linn.) On the Kansas.

E. obtusata (Pursh.) Little Blue river of the Kansas. July 23.

Pilinophytum capitatum (Klotzsch in Wiegem. arch. Apr. 1842.) *Croton capitatum* (Michx.) Forks of the Platte.

Hendecandra? (*Each.*) *multiflora*, n. sp.; annual canescent, with stellate pubescence; dioecious; stem somewhat diffusely and trichotomously branched; leaves ovate-oblong, petiolate, obtuse, entire; staminate flowers on crowded axillary and terminal compound spikes.—Laramie river, north fork of the Platte. Sept. 3-11.—About a foot high. Fructiferous plant unknown, with larger leaves. Forks of the Platte. July 2. This seems to be the same as the plant of Drummond's Texan Collection, III., No. 266.

SALICICEÆ.

Salix longifolia (Willd.) On the Platte.

S. Muhlenbergii (Willd.) With the preceding. Several other species exist in the collection:

some from
satisfactor
Populus tremu
P. angustifolia
Aug. 21.
P. monilifera

Ulmus fulva
Celtis crassifolia

Betula glandu
B. occidentalis

Pinus rigida (
P. undetermin
and *P. Lar*
P. (Abies) alb
P. near Balas
Juniperus Virg

Sagittaria sagi

Plantanthera lev
P. hyperborea (
Spiranthes cern
Specterum hyper

Sisyrinchium a
Iris Missouri
Rhizoma ve
ered, terete

Yucca angustif
Allium reticul
Smilacina stello

Zigadenus glan

some from the Platte; others from the mountains; but I have had no time to determine them satisfactorily.

Populus tremuloides (Michx.) Lake in the Wind River mountains.

P. angustifolia (Torr. in ann. Lyc. N. Hist. of New York, 2, p. 249.) Sweet Water river. Aug. 21.

P. monilifera (Alt.) Lower Platte.

ULMACEÆ.

Ulmus fulva (Michx.) Lower Platte.

Celtis crassifolia (Nutt.) With the preceding.

BETULACEÆ.

Betula glandulosa (Michx.) On a lake in the Wind River mountains. Aug. 12-17.

B. occidentalis (Hook.) With the preceding.

CONIFERÆ.

Pinus rigida (Linn.) Lower Platte. Without cones. Leaves in threes, about 3 inches long. ♀

P. undetermined. Defiles of the Wind River mountains. Aug. 13-14. Between *P. Strobus* and *P. Lambertiana*. Leaves in 5's, 1½-2 inches long, rigid. No cones.

P. (Abies) alba (Michx.) With the preceding.

P. near Balsamea. With the preceding. Leaves only.

Juniperus Virginiana (Linn.) Lower Platte.

ENDOGENOUS PLANTS.

ALISMACEÆ.

Sagittaria sagittifolia (Linn.) On the Kansas.

ORCHIDACEÆ.

Platanthera leucophaea (Lindl.) Black Hills. July 27.

P. hyperborea (R. Br.) Laramie river to the Red Buttes. Aug. 26-31.

Spiranthes cernua (Rich.) Sweet Water river. Aug. 7.

Sphegodesmus hyemalis (Nutt.) On the Platte. June 29.

IRIDACEÆ.

Sisyrinchium anceps (Linn.) North fork of the Platte. July 12.

Iris Missouriensis (Nutt. in Jour. Acad. Phil. 7, p. 58.) In fruit. Sweet Water river. Aug. 3.

Rhizoma very thick. Leaves narrow, rigid, as long as the scape. Scape nearly naked, 2-flowered, terete, 10 inches high. Capsules oblong obtusely triangular. Flowers not seen.

LILIACEÆ.

Yucca angustifolia (Sims.) Laramie river. July 14.

Allium reticulatum (Fras.) Defiles in the Wind River mountains. Aug. 12-17.

Smilacina stellata (Desf.) From the Laramie river to the Red Buttes. Aug. 26-31.

MELANTHACEÆ.

Zigadenus glaucus (Nutt.) Sweet Water river. Aug.

August 13-16.

Platte. July 22.

Water river, Aug. 2.

Platte, from the Red

12-17.

capitatum (Michx.)

ubescence; dioecious;

long, petiolate, obtuse,

stikes.—Laramie river,

us plant unknown.

the same as the plant

list in the collection:

JUNCACEÆ.

Juncus schinatus (Muhl.) North fork of the Platte. Sept. 4.

COMMELYNACEÆ.

Tradescantia Virginica (Linn.) and a narrow-leaved variety. Kansas and Platte.

CYPERACEÆ.

Carex festucacea (Schk.) On the Kansas. June.

C. aurea (Nutt.) Little Blue river of the Kansas. June 22.

C. panicea (Linn.) Alpine region of the Wind River mountains, near perpetual snow. Aug.

C. atrata (Linn.) With the preceding.

GRAMINEÆ.

Spartina cynosuroides, (Willd.) Little Blue river of the Kansas. June 22.

Aristida pallens, (Pursh.) On the Platte. June 22.

Agrostis Michauxiana (Trin.) Little Blue river of the Kansas. June 22.

Phleum alpinum, (Linn.) Alpine region of the Wind River mountains. Aug. 13-14.

Bromus ciliatus (Linn.) On the Platte. June-Aug.

Festuca ovina (Linn.) Alpine region of the Wind River mountains. Aug. 13-14.

Festuca nutans, (Willd.) On the Kansas.

Poa laxa (Haenke.) With the preceding.

P. crocata (Michx. ?) With the preceding. Spikelets 2-flowered.

P. nervata (Willd.) On the Kansas.

Koeleria cristata (Pers.) Big Blue river of the Kansas, and on the Platte as high as Laramie river. June 20-July 22.

Deschampsia cespitosa, (Beauv.) Alpine region of the Wind River mountains. Aug. 13-14.

Andropogon scoparius (Michx.) Lower Platte.

A. nutans (Linn.) Laramie river, N. fork of the Platte. Sept. 3-4.

Hordeum jubatum (Ait.) Forks of the Platte. July 2.

Elymus Virginicus (Linn.) Big Blue river of the Kansas. June 20.

E. Canadensis (Linn.) Little Blue river of the Kansas. June 22.

Beckmannia cruciformis (Jacq.) North fork of the Platte. July 22.

EQUISETACEÆ.

Equisetum arvense (Linn.) On a lake in the Wind River mountains. Aug. 12-17.

FILICES.

Hypopeltis obtusa (Torr. compend. bot. N. States, p. 380, 1826.) *Aspidium obtusum* (W.)
Woodia Perriniana (Hook. and Grev. Icon. Fil. I. t. 68.) *Physematum* (Kaulf.)
tusum, (Hook. fl. Bor.—Am. 2 p. 259.) On the Platte.

nd Platte.

perpetual snow. Aug.

22.

23.
s. Aug. 13-14.

Aug. 13-14.

Platte as high as Lar

ountains. Aug. 13-14

Aug. 13-17.

pidium obtusum (W
lycematium (Kaulf.)

ASTRONOMICAL OBSERVATIONS.

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rendered it
June to the
Brockbank
was fourteen
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REMARKS.

The maps which accompany this report are on Flamsteed's modified projection, and the longitudes are referred to the meridian of Greenwich.

For the determination of astronomical positions we were provided with the following instruments :

- One telescope, magnifying power 120.
- One circle, by Gambey, Paris.
- One sextant, by Gambey, Paris.
- One sextant, by Troughton.
- One box chronometer, No. 7,810, by French.
- One Brockbank pocket chronometer.
- One small watch with a light chronometer balance, No. 4,632, by Arnold & Dent.

The rate of the chronometer 7,810, is exhibited in the following statement :

" NEW YORK, May 5, 1842.

" Chronometer No. 7,810, by French, is this day at noon,

" <i>Slow</i> of Greenwich mean time	-	-	-	11' 4"
" <i>Fast</i> of New York mean time	-	-	-	4h 45' 1"
" <i>Loses</i> per day	-	-	-	2" $\frac{1}{5}$

" ARTHUR STEWART,

" 74 *Merchants' Exchange*."

An accident, among some rough ground in the neighborhood of the Kansas river, strained the balance of this chronometer (No. 7,810), and rendered it useless during the remainder of the campaign. From the 9th of June to the 24th of August inclusively, the longitudes depend upon the Brockbank pocket chronometer; the rate of which, on leaving St. Louis, was fourteen seconds. The rate obtained by observations at Fort Laramie, 14".05, has been used in calculation.

From the 24th of August until the termination of the journey, No. 4,632, of which the rate was 35".79, was used for the same purposes. The rate of this watch was irregular, and I place but little confidence in the few longitudes which depend upon it, though, so far as we have any means of judging, they appear tolerably correct.

Table of latitudes and longitudes, deduced from the annexed observations.

Date.	Station.	Latitude.	Longitude.	
			In time.	In arc.
1842.		deg. min. sec.	h. min. sec.	deg. min. sec.
May 27.....	St. Louis—residence of Colonel Brant	39 37 34	6 01 03.7	90 15 55
June 4.....	Chouteau's lower trading post, Kansas river	39 05 57	6 16 39	94 39 31
16.....	Left bank of the Kansas river, seven miles above the ford,	39 06 40	6 24 40	96 10 06
18.....	Vermilion creek.....	39 15 19	6 36 26.7	96 36 40
19.....	Cold Springs near the road to Laramie)	39 30 40	6 37 12.3	96 46 05
20.....	Big Blue river.....	39 45 06	6 39 37.8	97 06 58
23.....	Little Blue river.....	40 26 50	6 35 36.5	97 54 08
26.....	Right bank of Platte river	40 41 06	6 37 11.1	99 17 47
27.....	Right bank of Platte river	40 39 32	6 38 31	99 37 45
28.....	Right bank of Platte river	40 39 51		
30.....	Junction of North and South forks of the Nebraska or Platte river.....	40 39 55	6 43 32.7	100 34 10
July 2.....	South fork of Platte river—left bank.....	41 05 05	6 45 25.6	101 31 24
4.....	South fork of Platte river—left bank.....	41 05 05	6 45 25.6	102 09 50
6.....	South fork of Platte river—left bank.....	40 51 17	6 49 11.3	103 35 04
7.....	South fork of Platte river—left bank	40 33 36	6 56 08.9	104 03 13
11.....	South fork of Platte river—St. Vrain's fort	40 23 35	7 03 00.9	105 45 13
12.....	Crow creek.....	40 41 39	7 02 13.4	105 33 37
13.....	On a stream, name unknown.....	41 06 30	7 09 54.5	105 13 36
14.....	Horse creek—Goshen's Hole?.....	41 40 13	6 59 57.6	104 59 53
16.....	Fort Laramie, near the mouth of Laramie's fork	43 13 10	7 01 34.6	105 31 10
23.....	North fork of Platte river	43 39 35	7 04 13	106 03 40
24.....	North fork of Platte river.....	43 47 40		
25.....	North fork of Platte river—Dried Meat camp	43 51 35	7 05 40.7	106 35 10
26.....	North fork of the Platte river—noon halt.....	43 50 06		
28.....	North fork of Platte river—mouth of Deer creek	43 53 34	7 06 33	106 43 15
29.....	North fork of Platte river—Cache camp	43 39 33	7 08 03.7	107 15 53
30.....	North fork of Platte river—left bank	43 38 01	7 09 46.4	107 39 06
30.....	North fork of Platte river—Goat island.....	43 33 37	7 10 30.9	107 37 37
August 1.....	Sweet Water river—one mile below Rock Independence	43 39 56	7 11 40	107 55 01
4.....	Sweet Water river	43 32 31		
7.....	Sweet Water river	43 32 31		
8.....	Little Sandy creek, tributary to the Colorado of the West	43 37 15	7 19 26	108 51 39
9.....	New fork—tributary to the Colorado	43 37 34	7 20 31	109 07 46
10.....	Mountain lake	43 43 46	7 21 57.3	109 39 17
15.....	Highest peak of the Wind River mountains.....	43 49 49	7 23 29.7	110 37 55
19.....	Sweet Water—noon halt	43 34 33		
19.....	Sweet Water river	43 34 33		

24	North fork of Platte river—Dried Meat camp	43	50	68	7	65	53	100	51	38
25	North fork of Platte river—noon halt	43	53	34	7	68	53.7	107	15	55
26	North fork of Platte river—mouth of Deer creek	43	53	53	7	68	56.4	107	20	06
27	North fork of Platte river—Cache camp	43	56	01	7	10	50.9	107	37	57
28	North fork of Platte river—left bank	43	53	37	7	11	40	107	55	01
29	North fork of Platte river—Goat island	43	53	58						
30	North fork of Platte river—one mile below Rock Independence	43	53	31						
August 1	Sweet Water river									
4										
7	Sweet Water river									
8	Little Sandy creek, tributary to the Colorado of the West	43	57	15	7	13	26	100	51	38
9	New fork—tributary to the Colorado	43	57	34	7	20	31	110	07	45
10	Mountain lake	43	42	48	7	21	57.2	110	39	17
15	Highest peak of the Wind River mountains	43	43	43	7	53	59.7	110	37	55
19	Sweet Water—noon halt	43	24	23						
19	Sweet Water river	43	22	23						
20	Sweet Water river—noon halt	43	21	16						
22	Sweet Water river—at Rock Independence	43	25	36						
22	North fork of Platte river—mouth of Sweet Water	43	27	18	7	11	01.8	107	45	37
23	Horse Shoe creek—noon halt	43	24	24						
30	North fork of Platte river—right bank	43	01	48						
September 3	North fork of Platte river, near Scott's bluffs	41	54	38						
4	North fork of Platte river—right bank—six miles above Chimney Rock	41	43	36						
5	North fork of Platte river—mouth of Ash creek	41	17	15						
8	North fork of Platte river—right bank	41	14	30						
9	North fork of Platte river—Cedar bluffs	41	10	16						
10	Platte river—noon halt	40	54	31						
16	Platte river—left bank	40	53	34						
16	Platte river—do.	40	43	28						
17	Platte river—do.	40	40	31						
18	Platte river—do.	40	39	44						
19	Platte river—noon halt—left bank	40	48	19						
20	Platte river—left bank	40	54	63						
21	Platte river—do.	41	05	37						
23	Platte river—noon halt—left bank	41	30	30						
23	Platte river—left bank	41	23	38						
25	Platte river—mouth of Loup fork	41	23	11						
28	Platte river—mouth of Elk Horn river	41	03	34						
29	Platte river—left bank	41	03	15						
October 2	Bellevue—at the post of the American Fur Co., right bank of the Missouri river	41	03	24	6	23	11	95	47	45
4	Left bank of the Missouri—opposite to the right bank of the mouth of the Platte	41	02	11						
5	Missouri river	40	34	08						
6	Bertholet's island—noon halt	40	27	08						
6	Missouri river—mouth of Nishnabotona river	40	16	40						
8	Missouri river—left bank	39	36	03						
10	Missouri river—mouth of the Kansas river	39	06	03	6	15	11.6	94	38	54

St. Louis.—Residence of Col. J. B. Brant.

DETERMINATION OF TIME.

May 24, 1842.—Altitude of the Sun.

Observations.

Double altitude of the lower limb of the sun.			Time of chronometer. (Brockbank.)		
deg.	min.	sec.	h.	min.	sec.
40	40	10	6	39	54
41	19	30	6	36	55
40	30	10	6	38	54

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	
5	13	40	1	22	35	.....

DETERMINATION OF LONGITUDE.

May 27, 1842.—Altitude of Vega.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Vega.			Time of chronometer. No. 7,810.			Double altitude of Vega.			Time of chronometer. No. 7,810.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
87	03	20	3	57	43	90	43	30	4	06	41
88	04	50	3	50	31	91	17	20	4	08	10
88	50	10	4	01	31	92	01	56	4	10	09
89	22	20	4	03	01	92	39	40	4	11	52
89	54	20	4	04	25	93	23	10	4	13	46

Thermometer 66°.

*St. Louis.—Residence of Col. J. B. Brent—Continued.**Result of calculation.*

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
10	18	35	8	49	01	90	15	51

DETERMINATION OF LATITUDE.

May 27, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
74	38	90	4	30	37
74	39	10	4	32	41
74	40	10	4	35	30

Index error = — 20'.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
37	18	12	10	43	48	39	37	24

me of chronometer.
No. 7,810.

h.	min.	sec.
4	06	41
4	08	10
4	10	09
4	11	52
4	13	46

Encampment at Chouteau's lower trading house, right bank of the Kansas river, 700 feet above the level of the Gulf of Mexico.

From this date, up to the 24th of August, the Brockbank pocket chronometer was used in noting time.

DETERMINATION OF LONGITUDE.

June 9, 1842.—Altitude of the sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer. (Brockbank.)			Double altitude of the Sun's lower limb.			Time of chronometer. (Brockbank.)		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
53	19	00	6	29	32.5	51	21	30	6	34	39.5
52	54	50	6	30	36.0	51	02	20	6	35	30.0
52	39	35	6	31	15.6	50	45	50	6	36	12.3
52	22	25	6	32	01.0	50	24	00	6	37	10.0
52	02	50	6	32	51.0	50	10	00	6	37	45.7

Index error = — 25".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
4	57	22	1	36	25	94	39	31

DETERMINATION OF LATITUDE.

June 9, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
75	24	50	3	29	59
75	25	05	3	31	50
75	26	00	3	33	35
75	26	20	3	35	22
75	27	00	3	37	00
75	28	40	3	38	44
75	28	50	3	40	42
75	28	10	3	42	05
75	30	40	3	44	14
75	30	50	3	46	07

Thermometer 55°.

Double al
lower lim

deg.
56
56
55
55
55

*Encampment at Chateau's lower trading-house.—Continued.**Result of calculation.*

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
37	42	26	9	31	43	39	05	53

June 9, 1842.—Altitude of Antares in the meridian.

Double altitude of Antares.			True altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
49	42	50	24	49	17	39	06	00

of the Kansas
rivers.

ocket chronom-

RIES.

me of chronometer.
(Brockbank.)

h.	min.	sec.
6	34	39.5
6	35	30.0
6	36	12.3
6	37	10.0
6	37	45.7

Encampment on the left bank of the Kansas river.

DETERMINATION OF LONGITUDE.

June 16, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun.			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
58	40	00	6	26	31.5	53	37	50	6	34	26.0
56	13	55	6	27	41.5	53	21	45	6	35	07.7
55	53	15	6	28	34.0	53	08	00	6	35	47.0
55	35	20	6	29	22.0	52	49	55	6	36	32.7
55	16	55	6	30	10.0	52	30	30	6	37	23.0

Result of calculation.

Mean time.	Advance.	Longitude.
.....		

Encampment on the left bank of the Kansas river.—Continued.

DETERMINATION OF LATITUDE.

June 16, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
75	31	20	10	53	40
75	32	50	10	56	14
75	34	20	10	58	42
75	34	20	11	00	39
75	34	55	11	02	30
75	36	50	11	04	30
75	37	00	11	06	16
75	37	30	11	08	16
75	37	55	11	09	43
75	39	40	11	12	59

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
37	46	42	9	22	30	39	06	40

DETERMINATION OF LATITUDE.

June 16, 1842.—Altitude of α Aquilæ.*Observations.*

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
50	14	00	11	26	08	52	43	40	11	32	46
51	11	20	11	28	42	53	29	00	11	34	42
51	52	20	11	30	28	54	17	40	11	36	49

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	50	47	1	40	48	96	10	06

Encampment on Little Vermillion creek.

DETERMINATION OF LONGITUDE.

June 18, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun.			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
40	41	00	7	10	41.0	39	05	00	7	14	58.0
40	19	90	7	11	38.0	38	43	50	7	15	52.5
40	01	00	7	12	26.5	38	30	10	7	16	30.0
39	44	10	7	13	11.5	38	13	50	7	17	14.0
39	19	40	7	14	17.5	38	00	00	7	17	50.0

Index error = — 35".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	32	18	1	42	10	96	36	40

DETERMINATION OF LATITUDE.

June 18, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
75	49	00	10	44	04
75	50	20	10	48	08
75	51	40	10	51	48
75	52	20	10	53	34
75	53	20	10	55	09

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
37	54	12	9	08	46	39	15	18

Encampment on a tributary of the Big Vermillion creek, 1,350 feet above the level of the Gulf of Mexico.

Encampment

DETERMINATION OF LONGITUDE.

June 19, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.			SECOND SERIES.		
Double altitude of the lower limb of the Sun.			Double altitude of the lower limb of the Sun.		
deg.	min.	sec.	h.	min.	sec.
35	16	40	7	18	16
37	59	30	7	19	09.4
37	43	45	7	19	45
37	24	35	7	20	36
36	45	20	7	22	22

Index error = — 42".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	39	43	1	42	41	96	48	05

DETERMINATION OF LATITUDE.

June 19, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
76	19	30	10	40	52
76	21	00	10	44	51
76	23	00	10	48	53
76	24	40	10	53	06
76	24	20	10	55	47
76	26	15	10	58	58
76	27	20	11	00	25
76	27	50	11	01	49
76	28	50	11	04	36
76	29	50	11	06	52

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
38	11	07	9	13	11	38	30	40

Double altit
Aquil

deg. min.
50 34
51 19
52 11

1,350 feet above

Encampment on the Little Blue river, 1,600 feet above the level of the Gulf of Mexico.

DETERMINATION OF LATITUDE.

June 25, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
78	15	20	10	36	14
78	16	45	10	40	50
78	17	50	10	43	36
78	19	25	10	45	14
78	20	15	10	46	57
78	20	20	10	48	25
78	20	50	10	49	45
78	21	25	10	51	23
78	22	15	10	52	40
78	23	10	10	54	17

Index error = + 25".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	09	00	8	57	19	40	26	56

DETERMINATION OF LONGITUDE.

June 25, 1842.—Altitude of α Aquilæ.*Observations.*

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
50	34	40	11	01	45.0	53	06	20	11	08	34.0
51	19	10	11	03	47.3	53	40	00	11	10	05.5
52	11	15	11	06	07.0	54	27	15	11	12	11.0

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	17	26	1	49	39	98	54	07

*Encampment on the Little Blue river.**First en*

DETERMINATION OF LATITUDE.

June 25, 1842.—Altitude of Antares near the meridian.

Observations.

Double altitude of Antares.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
45	55	30	11	18	02
46	03	00	11	19	42
46	23	50	11	26	26
46	27	30	11	27	46
46	33	20	11	30	04

Result of calculation.

True altitude.			Mean time.	Latitude.		
deg.	min.	sec.		deg.	min.	sec.
23	28	33	.....	40	26	43

First encampment on the right bank of Platte river, 1,970 feet above the level of the Gulf of Mexico.

DETERMINATION OF LATITUDE.

June 26, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
79	06	15	11	20	50
79	07	10	11	23	29
79	09	20	11	25	51
79	09	35	11	27	28
79	10	45	11	30	09
79	11	30	11	32	00
79	12	30	11	34	00
79	14	20	11	35	52
79	14	35	11	37	00
79	15	00	11	38	54

Index error = + 25".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	34	31	9	39	34	40	41	10

DETERMINATION OF LATITUDE.

June 26, 1842.—Altitude of Antares near the meridian.

Observations.

Double altitude of Antares.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
46	31	20	11	49	34
46	32	20	11	51	03

First encampment on the right bank of the Platte river.—Continued.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.				deg.	min.	sec.
23	14	13	.....			40	41	03

• DETERMINATION OF LONGITUDE.

June 26, 1842.—Altitude of α Aquilæ.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
74	24	40	12	05	20.5	.....	.....	.....	.....	.....	.....
75	04	50	12	07	15.5	78	36	35	12	17	35.5
75	39	30	12	08	58.0	79	16	45	12	19	30.0
76	10	10	12	10	26.0	79	44	30	12	20	56.0
76	47	15	12	12	10.0	.....	.....	.....	.....	.....	.....

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
10	23	06	1	50	59	99	17	47

Continued.

Second encampment on the right bank of the Platte river.

DETERMINATION OF LONGITUDE.

June 27, 1842.—Altitude of α Aquilæ.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
71	43	10	11	54	42.0	73	26	20	11	59	38
72	38	50	11	57	20.0	73	52	40	12	00	52
73	07	00	11	58	41.5	74	50	00	12	03	38

Index error = $+ 10''$

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
10	07	03	1	52	05	99	37	45

DETERMINATION OF LATITUDE.

June 27, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
78	59	45	11	13	03
79	01	30	11	16	46
79	04	00	11	20	40
79	05	55	11	24	12
79	07	00	11	26	05

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	30	50	9	28	36	40	39	32

Third encampment on the right bank of Platte river.

DETERMINATION OF LATITUDE.

June 28, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
78	59	20	11	05	05
78	59	35	11	07	32
79	00	25	11	09	46
79	01	15	11	10	02
79	01	50	11	13	08
79	03	30	11	14	49
79	04	35	11	16	42
79	05	20	11	18	09
79	05	55	11	19	11
79	06	40	11	20	50

Index error = - 20".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	30	13	9	20	25	40	39	50

Fifth encampment on the right bank of the Platte river.

DETERMINATION OF LATITUDE.

June 30, 1842.—Altitude of Antares, near the meridian.

Observations.

Double altitude of Antares.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
46	15	50	11	36	38
46	17	50	11	40	50
46	15	50	11	44	18

Index error = $-20''$.

Result of calculation.

True altitude.	Mean time.	Latitude.
.....		

DETERMINATION OF LONGITUDE.

June 30, 1842.—Altitude of α Aquilæ.

Observations.

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
61	12	40	11	17	05.5
61	48	30	11	18	49
62	22	20	11	20	19
63	10	50	11	22	35
63	59	50	11	24	52.6

*Fifth encampment on the right bank of Platte river—Continued.**Result of calculation.*

Mean time.			Advance.			Longitude.		
<i>h.</i>	<i>min.</i>	<i>sec.</i>	<i>h.</i>	<i>min.</i>	<i>sec.</i>	<i>deg.</i>	<i>min.</i>	<i>sec.</i>
9	25	00	1	55	24	100	38	10

DETERMINATION OF LATITUDE.

June 30, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
<i>deg.</i>	<i>min.</i>	<i>sec.</i>	<i>h.</i>	<i>min.</i>	<i>sec.</i>
79	16	40	10	57	01
79	17	25	10	59	13
79	19	00	11	01	20
79	19	35	11	02	56
79	20	40	11	04	44
79	21	10	11	06	09
79	21	50	11	07	50
79	22	40	11	09	19
79	23	00	11	10	50
79	24	40	11	12	50

Result of calculation.

True altitude.			Mean time.			Latitude.		
<i>deg.</i>	<i>min.</i>	<i>sec.</i>	<i>h.</i>	<i>min.</i>	<i>sec.</i>	<i>deg.</i>	<i>min.</i>	<i>sec.</i>
39	39	04	9	09	51	40	49	55

Continued.

Encampment at the junction of the North and South forks of the Platte river, 2,700 feet above the level of the Gulf of Mexico.

DETERMINATION OF LONGITUDE.

July 2, 1942.—Sun's altitude.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
35	21	30	7	44	57	32	12	20	7	53	39.0
34	54	00	7	46	11.5	32	00	00	7	54	14.5
34	24	50	7	47	32.0	31	48	10	7	54	49.0
33	46	15	7	49	19.5	31	29	30	7	55	40.0
33	01	50	7	51	23.5	31	14	10	7	56	23.5

Index error = — 18".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	53	34	1	57	50	101	22	00

DETERMINATION OF LONGITUDE.

July 2, 1842.—Altitude of α Aquilæ.*Observations.*

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
73	25	40	11	46	41	75	36	25	11	53	03
74	10	30	11	48	51	76	18	40	11	55	06
74	49	20	11	50	42	76	43	10	11	56	18

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	53	58	1	57	49	101	23	00

Encampment at the junction of the North and South fork of the Platte river.—Continued.

DETERMINATION OF LATITUDE.

July 2, 1842.—Altitude of Antares in the meridian.

Double altitude of the Star.			True altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
45	44	15	22	49	55	41	05	23

DETERMINATION OF LONGITUDE.

July 3, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
53	50	50	9	08	22.0	57	06	25	9	17	05.5
54	09	30	9	09	04.5	57	43	05	9	18	44.5
55	05	50	9	11	43.5	58	15	40	9	20	12.7
55	38	20	9	13	11.0	58	41	40	9	21	22.0
56	09	20	9	14	35.3	59	11	25	9	22	41.5

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	.....
7	18	01	1	57	41	

Time did not permit us to wait at some of the most important geographical positions for favorable weather, and I have occasionally referred to these the observations taken at less marked localities. By the chronometric difference, the lunar distance of September 16, observed about forty miles below, is referred to this place.

Encampment on the left bank of the South fork of Platte river.

DETERMINATION OF LONGITUDE.

July 4, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
55	49	40	6	52	23	53	54	15	6	57	05
55	24	10	6	53	05	53	34	00	6	57	59
54	57	10	6	54	17	53	20	40	6	58	35
54	30	50	6	55	25	53	02	30	6	59	23
54	14	50	6	56	10	52	44	30	7	00	11

Result of calculation.

Mean time.	Advance.	Longitude.
.....		

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23

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me of chronometer.

h.	min.	sec.
9	17	65.5
9	18	44.5
9	20	12.7
9	21	22.0
9	22	41.5

tude.

portant geographi-
y referred to these
chronometric dif-
ut forty miles be

Encampment on an island in the South fork of the Platte river.

DETERMINATION OF LATITUDE.

July 6, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
79	53	40	11	43	02
79	59	00	11	53	24

Index error = + 15".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	57	21	9	42	30	40	51	17

DETERMINATION OF LONGITUDE.

July 6, 1842.—Altitude of α Aquilæ.*Observations.*

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
80	53	20	12	00	14
82	52	10	12	06	14

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	57	31	2	05	43	103	35	04

Platte river.

Encampment on the South fork of Platte river.

DETERMINATION OF LONGITUDE.

July 7, 1842.—Altitude of α Aquilæ.*Observations.*

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	29	20	19	04	45
84	16	10	12	07	07
85	19	50	12	10	54
86	01	20	12	12	32
86	41	30	12	14	37

Index error = + 15".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
10	02	42	2	07	17	104	02	13

DETERMINATION OF LATITUDE.

July 7, 1842.—Altitude of Polaris.

Observations.

Double altitude of Po- laris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
79	43	40	12	13	37
79	44	50	12	21	39
79	48	00	12	24	28
79	51	00	12	29	54
79	52	40	12	33	19

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	53	11	10	18	17	40	33	26

Encampment at St. Vrain's fort, South fork of Platte river, 5,440 feet above the level of the Gulf of Mexico.

July 11, 1842.—Altitude of the Sun.

DETERMINATION OF LONGITUDE.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
50	01	40	9	18	23	53	00	00	9	26	17
50	34	50	9	19	52	53	36	55	9	27	53.5
51	01	05	9	21	02	54	17	20	9	29	40
51	28	10	9	22	13	54	48	15	9	31	02
52	02	55	9	23	45	55	21	30	9	32	30

Index error = + 15".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
7	11	54	2	13	22	105	45	13

DETERMINATION OF LONGITUDE.

July 12, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
62	33	10	9	51	51	66	09	30	10	01	20
63	27	20	9	54	13	67	09	30	10	04	55.5
63	57	00	9	55	32	.....	.....	.....	.....	.....	.....
64	48	00	9	57	45	.....	.....	.....	.....	.....	.....

er, 5,440 feet

Encampment on Crow creek.

DETERMINATION OF LATITUDE.

July 12, 1842.—Altitude of Polaris.

Observations.

es.

ne of chronometer.

h.	min.	sec.
9	26	17
9	27	53.5
9	29	40
9	31	02
9	32	30

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
79	39	30	11	31	28
79	41	40	11	35	29
79	45	40	11	41	24

Index error = + 7".

Result of calculation.

de.

sec.
13

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
39	50	13	9	25	31	40	42	00

DETERMINATION OF LONGITUDE.

July 12, 1842.—Altitude of *a* Aquilæ.*Observations.*

Es.

ne of chronometer.

h.	min.	sec.
0	01	20
0	04	55.5

FIRST SERIES.						SECOND SERIES.					
Double altitude of <i>a</i> Aquilæ.			Time of chronometer.			Double altitude of <i>a</i> Aquilæ.			Time of chronometer.		
<i>deg.</i>	<i>min.</i>	<i>sec.</i>	<i>h.</i>	<i>min.</i>	<i>sec.</i>	<i>deg.</i>	<i>min.</i>	<i>sec.</i>	<i>h.</i>	<i>min.</i>	<i>sec.</i>
83	15	20	11	49	47	85	36	30	11	57	01
84	38	30	11	53	58	86	26	10	11	59	36

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	42	53	2	12	12	105	33	27

Encampment on a fork of Lodge Pole creek, 5,450 feet above the Gulf of Mexico.

DETERMINATION OF LATITUDE.

July 13, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
80	37	30	11	35	16
80	39	50	11	39	10
80	43	00	11	41	24

Index error = + 15".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
40	19	12	9	28	50	41	08	34

DETERMINATION OF LONGITUDE.

July 13, 1842.—Altitude of α Aquilæ.

Observations.

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	36	30	11	46	45
84	21	20	11	49	06
85	05	40	11	51	22
85	41	10	11	53	14
86	34	50	11	56	01
87	12	10	11	58	05

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	41	47	2	10	39	105	13	38

Encampment on Horse creek.

DETERMINATION OF LONGITUDE.

July 14, 1842.—Altitude of α Aquilæ.*Observations.*

FIRST SERIES.			SECOND SERIES.		
Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
71	33	00	11	07	04
72	27	30	11	09	39

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
73	20	40	11	12	16
74	16	50	11	15	01

Index error = + 15".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	01	29	9	09	31	104	59	23

DETERMINATION OF LATITUDE.

July 14, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
82	05	30	12	06	09
82	09	30	12	11	09
82	11	30	12	13	57
82	15	20	12	19	16

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	04	23	10	03	10	41	40	13

Encampment at Fort Laramie, 4,470 feet above the level of the Gulf of Mexico.

DETERMINATION OF LONGITUDE.

July 16, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
58	31	20	9	40	21.0	60	19	20	9	44	52.5
58	58	40	9	41	33.5	60	37	50	9	46	01.0
59	18	30	9	42	28.0	60	49	50	9	46	24.8
59	28	10	9	42	54.0	60	59	20	9	46	59.8
59	45	00	9	43	40.4	61	11	00	9	47	32.5

Thermometer 81°.3.

Index error = + 25".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
4	26	17	2	10	35	105	20	13

DETERMINATION OF LONGITUDE.

July 18, 1842.—Altitude of α Aquilæ.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
79	31	10	11	17	04.5	80	55	40	11	21	29
79	57	00	11	18	25.5	81	24	40	11	23	09
80	32	30	11	20	18.0	81	47	20	11	24	10

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
9	10	46	2	09	58			

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deg.
40
40
41
41
41

Encampment at Fort Laramie.—Continued.

DETERMINATION OF LATITUDE.

July 18, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
82	59	10	11	36	24
83	00	50	11	39	00
83	02	30	11	41	34
83	04	50	11	43	45
83	06	00	11	45	31

Thermometer, 63°.

Index error, = + 25".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	30	38	9	31	14	42	12	10

DETERMINATION OF LONGITUDE.

July 20, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
40	13	20	8	52	08.0	41	56	40	8	56	51.0
40	41	00	8	53	25.5	42	03	30	8	57	28.6
41	02	55	8	54	25.0	42	20	20	8	57	56.0
41	23	30	8	55	21.0	42	33	40	8	58	33.0
41	40	50	8	56	08.0	42	52	20	8	59	25.0

Thermometer, 65°.

Index error, = + 25".

Encampment at Fort Laramie.—Continued.

DETERMINATION OF LONGITUDE.

July 21, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
39	45	20	8	51	23.0	41	24	50	8	55	57.0
40	29	50	8	53	05.5	41	42	10	8	56	44.0
40	30	20	8	53	43.0	41	54	20	8	57	16.4
40	54	10	8	54	32.5	42	07	30	8	57	52.3
41	05	00	8	55	01.0	42	22	40	8	58	34.3

Thermometer, 66°.

Index error = + 25".

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	
6	46	00	2	09	25	.....

By the chronometric difference, the lunar distance observed at Dried Meat camp is referred to this place.

Encampment on the North fork of Platte river.

DETERMINATION OF LONGITUDE.

July 23, 1842.—Altitude of α Aquila.*Observations.*

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquila.			Time of chronometer.			Double altitude of α Aquila.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
78	03	30	10	55	54.5	81	35	40	11	07	02.0
79	22	45	11	00	00.0	82	10	00	11	08	52.0
79	49	50	11	01	22.5	82	27	20	11	09	50.5
80	11	25	11	02	36.5	83	07	00	11	11	57.0
80	33	50	11	03	48.0						

Index error = + 25".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
9	53	28	2	11	37	.....		

DETERMINATION OF LATITUDE.

July 23, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	00	10	11	29	08
84	01	20	11	31	34
84	02	20	11	32	45
84	03	15	11	33	57
84	04	15	11	35	20
84	05	25	11	36	50
84	07	20	11	38	57
84	07	25	11	40	02
84	10	00	11	43	04
84	11	50	11	45	44

*Encampment on the North fork of Platte river—Continued.**Result of calculation.*

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	01	54	9	23	39	49	39	95

DETERMINATION OF LONGITUDE.

July 23, 1842.—Altitude of Arcturus.

Observations.

Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
75	13	40	12	01	00
74	51	10	12	02	23
74	04	20	12	04	29.5

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	
9	51	01	2	11	39	.....

Encampment on the North fork of Platte river—Dried Meat camp.

DETERMINATION OF LONGITUDE.

July 25, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
48	24	00	7	16	28.0	48	42	40	7	21	04.4
48	10	50	7	17	01.0	48	27	40	7	21	45.5
47	49	50	7	17	58.5	46	11	50	7	22	27.0
47	24	40	7	19	07.0	45	55	40	7	23	11.6
47	02	00	7	20	09.0	45	37	45	7	24	03.0

Thermometer, 87°.0

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	07	44	2	12	35	106	24	09

DETERMINATION OF LATITUDE.

July 25, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	18	20	11	12	32
84	19	25	11	15	16
84	20	40	11	16	31
84	21	25	11	17	55
84	23	20	11	20	53

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	09	35	9	02	58	42	51	35

Encampment at Dried Meat camp—Continued.

DETERMINATION OF LONGITUDE.

July 25, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
86	16	15	11	23	43	84	49	30	11	27	46
85	41	25	11	25	21	84	13	40	11	29	27
85	16	40	11	26	31	83	26	50	11	31	37

Thermometer 72°.5.

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	.....
9	14	48	2	12	36	

DETERMINATION OF LONGITUDE.

July 25, 1842.—Distance from the second limb of the Moon to Jupiter.

Observations.

Time of chronometer.			Apparent distance.		
h.	min.	sec.	deg.	min.	sec.
11	45	04	58	33	50
11	47	20	58	34	50
11	49	32	58	36	30
11	50	55	58	37	40
11	52	18	58	38	25

Index error = + 15".

Result of calculation.

True distance.			Mean time at Greenwich.			Longitude of the place.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
58	04	42	16	42	11	106	26	11

Encampment on the North fork of the Platte river, mouth of Deer creek

DETERMINATION OF LATITUDE.

July 26, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris,			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	22	40	11	14	27
84	25	00	11	15	36
84	27	10	11	19	06
84	27	00	11	20	10
84	29	00	11	22	11
84	30	10	11	23	57
84	32	50	11	28	06
84	34	20	11	29	33
84	34	50	11	30	39
84	37	00	11	33	32

Index error = + 15".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	14	16	9	10	02	42	52	24

Encampment at the mouth of Deer creek—Continued.

DETERMINATION OF LONGITUDE.

July 26, 1842.—Altitude of the Sun.

Observations.

Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
46	47	45	7	21	03.0
46	31	40	7	21	45.5
Interrupted			by clouds.		
45	37	15	7	24	14.5
45	22	10	7	24	56.6
45	01	10	7	25	54.0
44	37	30	7	27	00.0

Thermometer, 83°.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	09	54	9	13	33	106	43	15

DETERMINATION OF LONGITUDE.

July 26, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.			SECOND SERIES.		
Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
30	29	50	11	36	47
29	53	49	11	38	12
29	34	25	11	39	20
Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
79	13	30	11	40	16.5
78	52	00	11	41	17.0
78	32	30	11	42	11.0

Thermometer, 71°.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
9	26	06	2	13	34	.....		

Encampment on the North fork of Platte river—Upper Cocks camp.

DETERMINATION OF LONGITUDE.

July 28, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun.			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
45	19	55	7	25	21.5	43	46	20	7	29	17.7
44	56	10	7	26	05	43	35	25	7	29	48
44	45	35	7	26	36.2	43	17	15	7	30	37
44	30	20	7	27	17.5	43	05	05	7	31	11
44	15	20	7	27	58.6	43	51	40	7	31	47.7

Thermometer 80°.5.

Index error = + 12".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	13	27	2	15	09	107	15	55

DETERMINATION OF LATITUDE.

July 28, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	31	30	11	24	10
84	32	45	11	25	45
84	35	10	11	27	55
84	35	30	11	29	12
84	36	35	11	30	34
84	38	10	11	31	50
84	39	55	11	33	25
84	40	00	11	34	43
84	40	25	11	35	55
84	42	15	11	37	24

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	17	54	9	15	59	42	50	53

Encampment on the North fork of Platte river.

DETERMINATION OF LATITUDE.

July 29, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	53	40	11	05	00
83	57	10	11	07	47
83	57	30	11	09	10
83	59	45	11	12	14
84	00	40	11	14	16
84	03	00	11	16	00
84	04	10	11	18	21
84	05	00	11	20	05
84	06	40	11	21	42
84	08	10	11	23	05

Thermometer, 60°.

Index error = + 12".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	00	01	8	58	58	42	38	01

Encampment on the North fork of Platte river.

DETERMINATION OF LONGITUDE.

July 29, 1842.—Altitude of α Aquilæ.*Observations.*

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
81	29	00	10	47	19
82	04	50	10	49	11
82	35	30	10	50	50.5

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
8	33	13	9	15	54	107	29	06

DETERMINATION OF LONGITUDE.

July 29, 1842.—Altitude of Arcturus.

Observations.

Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
91	57	20	10	55	42
91	17	50	10	57	33.7
90	44	10	10	59	05

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	
8	41	30	9	15	57	.....

GOAT ISLAND, &c.

Favorable weather enabled us to observe here an occultation of α Arietis, which occurred at the moon's bright limb, at 0h. 05' 40" of the 31st of July (civil time). In order that it might be calculated with the advantage of correspondent observations, and the correction of the errors of the tables, the observation was sent to Mr. S. C. WALKER, at Philadelphia. The following is the result from Mr. Walker's computation, without any correction for errors of the tables.

July 30, 1842—astronomical time.

$$\text{Im. } \alpha \text{ Arietis } \overbrace{12^{\text{h}} 5' 40''}^t - \overbrace{7^{\text{h}} 10' 32''.01}^{a'} + \overbrace{1.896}^a + \overbrace{1.611}^b + \overbrace{2.488}^c.$$

By the estimated difference of longitude, thirty two seconds (32"), the lunar distance observed at the mouth of the Sweet Water on the 23d of August, is referred to this place, for the longitude of which we have adopted the mean from chronometer, lunar distance, and occultation, resulting as follows:

	<i>h.</i>	<i>min.</i>	<i>sec.</i>
Longitude of Goat island, by lunar distance,	7	10	07.91
Longitude of Goat island, by chronometer,	7	10	51.66
Longitude of Goat island, by occultation,	7	10	32.01

Mean longitude of Goat island,	7	10	30.53
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Some of the observations made at this place were lost in the accident in the Platte river, on the 24th of August.

Encampment on Goat island, North fork of the Platte river.

DETERMINATION OF LATITUDE.

July 30, 1842.—Altitude of the Sun in the meridian.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
131	22	30	65	56	52	42	33	27

Index error = + 12".

DETERMINATION OF LONGITUDE.

July 31, 1842.—Altitude of α Aquilæ.*Observations.*

Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
99	51	50	3	01	02
99	09	30	3	04	02
98	45	50	3	05	42

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	.....
0	46	59	2	16	36	.....

DETERMINATION OF LONGITUDE.

July 31, 1842.—Altitude of α Aurigæ.*Observations.*

Double altitude of α Aurigæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
48	38	20	4	13	40

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	deg. min. sec.
1	57	09	2	16	31	.....

Encampment on the Sweet Water river, one mile below Rock Independence.

DETERMINATION OF LATITUDE.
August 1, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	04	20	11	29	33
84	05	50	11	31	12
84	05	00	11	32	15
84	07	50	11	33	42
84	09	00	11	35	20
84	10	00	11	36	37
84	11	40	11	38	13
84	13	00	11	39	38
84	13	15	11	40	48
84	14	00	11	42	14

Thermometer 47°.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
43	03	54	9	18	40	43	29	56

Index error = + 12".

DETERMINATION OF LONGITUDE.
August 1, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
66	41	00	11	54	55.0	64	00	00	12	02	10.0
66	16	20	11	56	03.0	63	22	50	12	03	52.0
65	50	30	11	57	10.0	62	46	30	12	05	29.6
65	24	10	11	58	19.5	62	14	10	12	06	57.0
64	49	20	11	59	55.5	61	48	50	12	08	06.0

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	44	00	2	17	18	107	55	00

Independence.

Encampment on the Sweet Water river.

DETERMINATION OF LATITUDE.

August 5, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
88	00	30	5	18	55
88	03	20	5	22	15
88	02	00	5	23	39
88	02	40	5	26	01
88	03	30	5	27	32

Thermometer, 57°.

Index error = + 25".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
44	00	35	3	02	49	42	32	31

DETERMINATION OF LONGITUDE.

August 5, 1842.—Altitude of α Lyrae.*Observations.*

Double altitude of α Lyrae.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
67	38	30	5	04	26.0
68	58	40	5	06	21.5
66	35	30	5	07	32.0

Sky very misty.—Observation indifferent.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	.....		
2	45	14	2	20	53			

Encampment on the Sweet Water river—Continued.

DETERMINATION OF LONGITUDE.

August 7, 1842.—Altitude of Arcturus.

Observations.

Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	deg.	min.	sec.
51	46	30	12	18	09
50	49	30	12	20	58
49	54	30	12	23	04

Index error = + 25".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	57	01	2	23	39	109	51	29

DETERMINATION OF LATITUDE.

August 7, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	59	25	12	30	38
85	00	00	12	32	19
85	01	20	12	33	25
85	02	30	12	34	57
85	03	20	12	36	21
85	05	00	12	37	49

Thermometer 36°.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
49	30	18	10	11	25	42	27	15

Encampment on Little Sandy creek.

DETERMINATION OF LONGITUDE.

August 8, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
44	51	50	7	24	45.5	43	59	30	7	28	28.5
44	33	00	7	25	34.0	43	16	50	7	29	02.0
44	16	50	7	26	18.0	43	06	30	7	29	28.4
44	04	00	7	26	53.5	42	52	25	7	30	06.5
43	50	50	7	27	22.0	42	38	10	7	30	47.0

Thermometer 63°.

Index error = + 23".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
5	03	23	2	24	30	110	07	46

DETERMINATION OF LONGITUDE.

August 8, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
77	19	05	11	05	38	75	21	30	11	11	09
76	39	40	11	07	31	75	00	40	11	11	56
76	09	30	11	08	49	74	39	25	11	12	53

Thermometer, 45°.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
8	45	07	2	24	31	.....		

Encampment on Little Sandy creek—Continued.

DETERMINATION OF LATITUDE.

August 8, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	38	40	10	41	26
83	41	30	10	44	41
83	42	30	10	47	10
83	45	30	10	49	48
83	46	00	10	51	16
83	48	30	10	54	33
83	50	20	10	56	14
83	50	40	10	58	08
83	52	30	10	59	51
83	53	25	11	01	08

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	59	50	8	27	54	49	27	34

Double al
Arcu
deg. min.
68 3
68 0
67 2

Encampment on the First New fork.

DETERMINATION OF LATITUDE.

August 9, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	32	30	11	10	13
84	34	40	11	19	19
84	35	30	11	13	45
84	35	50	11	14	57
84	37	30	11	16	3
84	38	00	11	17	29
84	39	10	11	19	00
84	40	00	11	20	34
84	40	50	11	21	53
84	42	30	11	23	20

Index error = + 25".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
43	18	13	8	51	00	43	43	56

DETERMINATION OF LONGITUDE.

August 9, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
68	33	40	11	26	37	64	37	35	11	31	54.0
68	02	25	11	28	04	65	56	15	11	33	48.0
67	27	00	11	29	41	65	14	00	11	35	40.5

Thermometer, 44°.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
9	05	15	2	25	42	110	29	17

Encampment at Mountain lake, 7,200 feet above the level of the Gulf of Mexico.

DETERMINATION OF LATITUDE.

August 10, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	55	90	11	15	55
84	55	50	11	17	00
84	57	30	11	18	28
84	58	00	11	19	56

Index error = — 12'.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
43	27	25	8	51	43	43	50	08

Encampment at Mountain lake—Continued.

DETERMINATION OF LATITUDE.

August 11, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	43	20	10	56	56
84	44	20	10	58	32
84	46	10	11	00	33
84	46	30	11	01	38
84	48	30	11	03	37
84	49	30	11	04	43
84	49	50	11	05	52
84	51	50	11	07	01
84	52	00	11	08	29
84	52	50	11	09	24

Thermometer, 54°.

Index error = — 12".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	23	19	8	37	54	42	49	55

Encampment on Mountain lake—Continued.

DETERMINATION OF LONGITUDE.

August 11, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun.			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
44	04	00	9	36	16.5	45	23	00	9	39	53.0
44	15	30	9	36	47.6	45	33	10	9	40	20.4
44	30	15	9	37	28.0	45	42	40	9	40	46.0
44	46	30	9	38	12.3	45	51	15	9	41	09.0
45	00	40	9	38	51.0	46	03	45	9	41	43.3

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
7	13	19	9	25	49	110	37	25

During my absence from this place, and between the 12th and 16th, the chronometer stopped.

Encampment at Mountain lake—Continued.

DETERMINATION OF LONGITUDE.

August 17, 1842.—Altitude of the Sun.

Observations.

RIES.

ime of chronometer.

h.	min.	sec.
9	39	53.0
9	40	20.4
9	40	46.0
9	41	09.0
9	41	43.3

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
40	02	15	5	54	48.0	41	46	50	5	59	31.4
40	20	00	5	55	36.3	42	01	20	6	00	12.0
40	35	15	5	56	17.0	42	18	05	6	00	57.7
40	48	35	5	56	54.0	42	38	20	6	01	53.0
41	17	20	5	58	10.5	42	50	15	6	02	26.3

Thermometer 64°.

Index error = — 32".

Result of calculation.

itude.

h.	min.	sec.
7	25	

th and 16th, the

Mean time.	Retard.	Longitude.
.....		

August 17, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
120	38	15	60	34	22	42	49	24

Encampment on the Sweet Water river.

DETERMINATION OF LATITUDE.

August 19, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	55	30	6	54	33
83	56	50	6	56	06
83	58	20	6	58	02
84	00	00	7	00	09
84	02	10	7	02	26

Index error = $-36''$.*Result of calculation.*

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	58	07	8	12	41	42	22	22

DETERMINATION OF TIME.

August 19, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.			SECOND SERIES.		
Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
66	51	10	7	12	03.5
65	33	35	7	15	30.0
65	01	40	7	16	57.5

Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
64	15	10	7	19	03.0
63	39	25	7	20	37.5
63	15	50	7	21	41.0

Result of calculation.

Mean time.			Retard.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
8	32	05	1	14	26	.....		

Encampment on the Sweet Water river—Continued.

DETERMINATION OF TIME.

August 20, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
53	58	00	7	40	46	48	59	20	7	54	15
52	19	20	7	45	13	48	28	50	7	55	38.5
51	17	40	7	47	59	47	47	00	7	57	34
50	36	30	7	49	51.5	47	17	30	7	58	52.6
49	53	40	7	51	47	46	08	40	8	02	02

Index error = - 40".

Result of calculation.

Mean time.			Retard.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
9	09	02	1	16	35	.....		

DETERMINATION OF LATITUDE.

August 20, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
85	26	00	8	17	06
85	26	30	8	18	52
85	27	55	8	20	47
85	31	40	8	24	56
85	32	00	8	26	32
85	33	55	8	27	50
85	34	40	8	29	18
85	36	15	8	31	19
85	37	30	8	32	44
85	38	50	8	34	39

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	45	05	9	43	02	42	31	46

Encampment on the Big Blue river.

DETERMINATION OF LONGITUDE.

June 21, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
42	09	40	8	20	15.0	43	44	30	8	24	29.5
42	36	40	8	21	27.0	43	58	00	8	25	03.0
42	51	10	8	22	04.5	44	12	45	8	25	44.3
43	08	40	8	22	54.0	44	29	10	8	26	27.0
43	26	30	8	23	40.0	44	46	00	8	27	19.0

Index error, = $-42''$.*Result of calculation.*

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
6	40	27	1	43	28	97	06	58

Noon halt on the Sweet Water river.

DETERMINATION OF LATITUDE.

August 22, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
118	08	05	53	19	10	43	26	16

Index error = — 40'.

Encampment on the Sweet Water river (Rock Independence).

DETERMINATION OF LATITUDE.

August 22, 1842.—Altitude of Polaris.

Observations.

Double altitude of Po- laris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	19	30	6	47	37
84	20	50	6	50	15
84	22	10	6	51	37
84	23	30	6	52	50
84	24	15	6	54	40
84	25	40	6	56	34
84	27	45	6	57	49
84	28	40	6	59	15
84	29	10	7	00	24
84	30	10	7	01	41

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	11	30	8	16	33	42	29	36

Encampment on the Sweet Water, at Rock Independence—Continued.

DETERMINATION OF TIME.

August 22, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
61	32	50	7	07	49.0	58	06	10	7	17	00.0
60	56	25	7	09	14.6	57	22	00	7	18	59.5
60	28	20	7	10	35.0	56	48	50	7	20	30.0
59	43	59	7	12	30.5	55	47	40	7	23	15.0
59	17	00	7	13	49.5	55	18	30	7	24	34.3

Index error = — 22".

Result of calculation.

Mean time.			Retard.			Longitude.
h.	min.	sec.	h.	min.	sec.	
8	37	06	1	21	17	.....

DETERMINATION OF TIME.

August 23, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun.			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
32	18	35	5	28	06	33	35	50	5	31	36
32	34	10	5	28	48.7	33	48	35	5	32	10
32	40	30	5	29	33	33	58	25	5	32	37
33	00	30	5	30	00	34	08	30	5	33	05
33	15	20	5	30	40	34	35	30	5	34	18.5

—Continued.

Encampment on North fork of Platte river, mouth of Sweet Water river.

DETERMINATION OF TIME.

August 23, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
44	21	05	3	19	43.0	43	01	30	3	23	17.4
43	55	50	3	20	51.5	42	52	10	3	23	43.4
43	43	30	3	21	23.3	42	39	55	3	24	17.5
43	30	50	3	21	58.5	42	27	30	3	24	50.3
43	17	30	3	22	35.0	42	13	50	3	25	27.4

Index error = — 22".

Result of calculation.

Mean time.			Retard.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
4	45	24	1	22	35	.....		

DETERMINATION OF LATITUDE.

August 23, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	20	00	6	49	55
84	21	30	6	52	20
84	22	15	6	53	04
84	24	20	6	55	14
84	25	20	6	56	32
84	26	30	6	57	56
84	28	10	6	59	28
84	28	25	7	00	59
84	30	20	7	02	29
84	31	10	7	04	13

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	12	50	8	22	08	42	27	18

Encampment on North fork of Platte river, mouth of the Sweet Water.—
Continued.

DETERMINATION OF LONGITUDE.

August 23, 1842.—Distance from the second limb of the Moon to Jupiter.
(With the circle.)

Observations.

Time of chronometer.			Apparent distance.		
h.	min.	sec.	deg.	min.	sec.
7	43	17	.....		
7	52	54	.....		
7	56	33	.....		
8	01	58	.....		
8	05	43	.....		
8	11	23	.....		
8	14	35	.....		
8	20	50	.....		
8	24	22	.....		
8	29	20	816	59	10

Result of calculation.

True distance.			Mean time at Greenwich.			Longitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
81	10	38	16	41	21	107	40	00

Noon halt on Horseshoe creek.

DETERMINATION OF LATITUDE.

August 30, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
112	38	35	56	33	57	43	24	24

Index error = — 1' 30".

Sheet Water.—

Encampment on the left bank of the North fork of the Platte river.

DETERMINATION OF LATITUDE.

September 4, 1842.—Altitude of α Aquilæ in the meridian.*Observations.*

Double altitude of α Aquilæ.			True altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
113	08	30	56	32	56	41	54	38

Index error, = $-1' 30''$.*Encampment on the right bank of the North fork of Platte river, five miles above Chimney Rock.*

DETERMINATION OF LATITUDE.

September 5, 1842.—Altitude of Polaris.

Observations.

Double altitude of Po- laris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	19	00	11	07	03
84	14	50	11	10	43
84	17	20	11	19	55
84	18	50	11	16	39
84	21	50	11	20	50

Index error, = $-1' 30''$.September 5, 1842.—Altitude of α Aquilæ in the meridian.*Observations.*

Double altitude of α Aquilæ.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
113	30	40	56	44	00	41	43	36

*Encampment on the right bank of the North fork of Platte river—mouth
of Ash creek.*

DETERMINATION OF LATITUDE.

September 8, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	43	00	11	16	22
83	41	10	11	18	59
83	44	50	11	21	07
83	43	30	11	23	20
83	46	50	11	24	57
83	48	10	11	26	56
83	49	50	11	28	30
83	50	00	11	30	11
83	51	40	11	31	41
83	53	40	11	33	26

Thermometer, 70°.3.

Index error = — 1' 32".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	50	57	9	19	51	41	16	19

September 8, 1842.—Altitude of α Aquilæ in the meridian.

Observations.

Double altitude of α Aquilæ.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
114	25	10	57	11	15	41	16	19

Campment on the North fork of Platte river—Lower Cache camp.

DETERMINATION OF LATITUDE.

September 9, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	38	55	11	12	52
83	38	10	11	16	39
83	40	30	11	20	01
83	43	30	11	23	13
83	46	25	11	27	33

Index error = — 1' 32".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	48	40	9	17	42	41	14	44

September 9, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
50	35	00	54	03	37	41	14	17

Thermometer, 94°.

*Encampment at the junction of the North and South forks of the Platte,
2,700 feet above the Gulf of Mexico.*

DETERMINATION OF LATITUDE.

September 12, 1842.—Altitude of α Aquilæ in the meridian.

Observations.

Double altitude of α Aquilæ.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
114	48	50	57	23	09	41	04	26

Index error = — 1' 20".

DETERMINATION OF LATITUDE.

September 13, 1842.—Altitude of the Sun in the meridian.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
104	51	25	52	40	22	41	05	07

Thermometer 70°.

Enca

Double
Sun's

deg.
37
37
36
36
36

of the Platte,

Encampment at the junction of the North and South forks of the Platte river—Continued.

DETERMINATION OF LATITUDE.

September 13, 1842.—Altitude of the Sun.

Observations.

Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
104	42	20	1	46	17
104	45	25	1	48	16
104	49	00	1	51	13
104	50	10	1	53	22
104	50	35	1	54	40
104	51	25	1	56	37
104	51	10	1	58	49
104	50	20	1	59	35
104	49	45	2	01	03
104	46	20	2	02	35
104	47	28	2	03	17
104	45	00	2	05	16
104	43	50	2	06	02
104	43	05	2	06	50
104	41	45	2	07	29

DETERMINATION OF TIME.

September 14, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
37	23	10	6	26	22.5	36	11	20	6	29	40.4
37	04	10	6	27	14.3	35	57	05	6	30	18.5
36	50	30	6	27	53.5	35	43	40	6	30	56.0
36	36	40	6	28	30.5	Interrupted by clouds.					
36	22	30	6	29	08.3						

Thermometer, 60°.

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	
4	28	40	2	00	24	.....

Noon halt on the left bank of the Platte.

DETERMINATION OF LATITUDE.

September 16, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
102	54	15	51	41	44	40	54	31

Index error = — 1' 17".

Encampment on the left bank of the Platte river.

DETERMINATION OF LATITUDE.

September 16, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	08	10	11	04	35
83	10	40	11	07	41
83	13	25	11	10	44
83	14	35	11	12	50
83	15	40	11	14	41
83	17	15	11	16	21
83	17	30	11	18	04
83	19	40	11	20	26
83	21	40	11	24	07
83	23	35	11	26	36

Index error = 1' 17".

Result of calculation.

True altitude.			Mean time.			Latitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	36	23	9	16	55	40	52	34

Encampment on the left bank of Platte river—Continued.

DETERMINATION OF LONGITUDE.

September 16, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
50	50	40	9	17	24.5	46	53	50	9	28	12.3
49	03	40	9	22	18.3	46	02	15	9	30	35
47	57	40	9	23	26.5	45	10	20	9	32	51.5

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	.....
7	27	27	1	58	41	.....

Encampment on the left bank of Platte river—Continued.

DETERMINATION OF LONGITUDE.

September 16, 1842.—Distance from the first limb of the moon to Jupiter.

Observations.

(With the circle.)

Time of chronometer.			Apparent distance.		
<i>h.</i>	<i>min.</i>	<i>sec.</i>	<i>deg.</i>	<i>min.</i>	<i>sec.</i>
9	36	57	.....		
9	42	24	.....		
9	46	36	.....		
9	52	19	.....		
9	58	51	.....		
10	03	40	.....		
10	06	44	.....		
10	10	21	.....		
10	14	28	.....		
10	18	19	.....		
10	21	57	.....		
10	23	49	.....		
10	28	13	.....		
10	30	18	.....		
10	33	56	.....		
10	35	45	.....		
10	37	54	.....		
10	40	25	.....		
10	42	37	.....		
10	45	11	837	45	50

Thermometer, $55^{\circ}.5$.*Result of calculation.*

True distance.			Mean time at Greenwich.			Longitude.		
<i>deg.</i>	<i>min.</i>	<i>sec.</i>	<i>h.</i>	<i>min.</i>	<i>sec.</i>	<i>deg.</i>	<i>min.</i>	<i>sec.</i>
42	07	42	14	56	30	100	23	45

nued.

Encampment on the left bank of Platte river—Continued.

DETERMINATION OF TIME.

September 17, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
37	10	40	9	48	56	34	02	15	9	57	23.7
35	28	45	9	53	30.5	33	08	50	9	59	46
34	48	45	9	55	15	32	25	20	10	01	44

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
7	58	41	1	57	25	.....		

DETERMINATION OF LATITUDE.

September 17, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
82	14	00	10	14	36
82	16	10	10	16	37
82	17	40	10	19	35
82	19	50	10	21	55
82	21	45	10	25	12
82	24	45	10	27	50
82	27	25	10	31	48
82	30	00	10	34	51
82	34	50	10	40	50
82	39	50	10	47	44

Thermometer 55°.

Index error = - 1' 18".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	10	36	8	30	41	40	42	38

tude.

a. sec.
45

Noon halt of September 18, on the left bank of the Platte river.

DETERMINATION OF LATITUDE.

September 18, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
101	49	50	51	09	29	40	40	21

Index error = — 1' 32".

Thermometer, 90°.

Noon halt of September 19, on the left bank of the Platte river.

DETERMINATION OF LATITUDE.

September 19, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
101	04	30	50	46	40	40	39	44

Index error = — 1' 32".

Thermometer, 80°.

Noon halt of September 20, on the left bank of the Platte river

DETERMINATION OF LATITUDE.

September 20, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
100	00	45	50	14	56	40	43	19

Index error = — 1' 32".

Thermometer, 77°.

Encampment on the left bank of Platte river.

DETERMINATION OF TIME.

September 20, 1842.—Altitude of Arcturus.

Observations.

Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
48	29	50	9	04	31

Index error = $-1' 32''$.

DETERMINATION OF LATITUDE.

September 20, 1842.—Altitude of Polaris.

Observations.

Double altitude of Po- laris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
82	05	10	9	19	49
82	08	20	9	24	02
82	15	15	9	31	51
82	17	50	9	36	39
82	20	40	9	39	35

Thermometer, 56° .*Result of calculation.*

True altitude.			Mean time.			Latitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	04	54	7	35	23	46	54	02

Encampment on the left bank of Platte river, ten miles below Grand island.

DETERMINATION OF TIME.

September 21, 1842.—Altitude of Arcturus.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of Arcturus.			Time of chronometer.			Double altitude of Arcturus.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
50	03	55	8	55	09.5	47	05	25	9	03	03.7
49	15	30	8	57	16.7	46	16	55	9	05	18.0
49	01	50	9	00	34.0	45	36	50	9	07	01.0

Result of calculation.

Mean time.			Advance.			Longitude.
deg.	min.	sec.	h.	min.	sec.	.....
7	07	54	1	53	29	

DETERMINATION OF LATITUDE.

September 21, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
82	25	50	9	10	56
82	27	45	9	12	51
82	29	20	9	15	43
82	31	40	9	18	07
82	34	00	9	20	53
82	35	15	9	22	30
82	37	45	9	24	15
82	37	40	9	25	47
82	40	00	9	28	13
82	41	00	9	30	09

Thermometer, 51°.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	15	11	7	27	51	41	05	38

below Grand

Noon halt at the mouth of a small creek on the left bank of the Platte river.

DETERMINATION OF LATITUDE.

September 23, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
96	37	05	48	33	04	41	20	20

Index error = — 1' 32".

Thermometer, 80°.

Encampment on the left bank of the Platte river, near the Loup fork.

DETERMINATION OF LATITUDE.

September 23, 1842.—Altitude of *a* Aquila in the meridian.*Observations.*

Double altitude of <i>a</i> Aquila.			True altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
114	12	10	57	04	43	41	22	52

Index error = — 1' 32".

*Encampment on the left bank of the Platte river, at the mouth of the
Loup fork.—Continued.*

DETERMINATION OF TIME.

September 26, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
40	12	50	9	38	24.6	42	01	45	9	43	39.7
40	27	25	9	39	68.0	42	12	50	9	44	10.0
40	38	35	9	39	40.2	42	26	10	9	44	49.0
40	53	25	9	40	19.5	42	36	55	9	45	20.0
41	04	00	9	40	52.8	42	49	25	9	45	58.0

Index error = — 1' 32".

Thermometer 73°.

Observation indifferent.

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	.....
7	50	14	1	52	00	.....

mouth of the

Encampment on the left bank of the Platte river, at the mouth of the Loup fork.—Continued.

DETERMINATION OF LATITUDE.

September 26, 1842.—Altitude of the Sun near the meridian.

Observations.

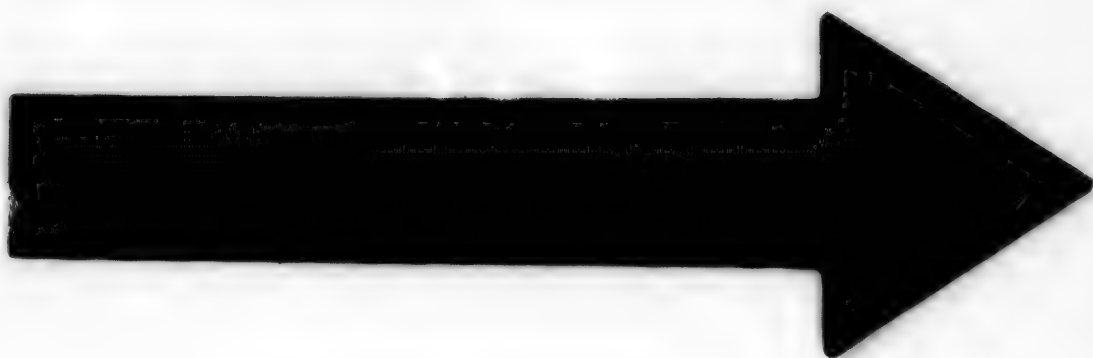
Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
93	56	45	1	25	17
94	00	30	1	30	13
94	01	45	1	30	43
94	02	15	1	31	17
94	04	00	1	32	04
Interrupted.					
94	06	30	1	35	58
94	10	00	1	37	19
94	11	55	1	39	34
94	13	35	1	40	49
Interrupted.					
94	09	25	1	48	38
94	06	25	1	51	30
94	05	50	1	52	22

Thermometer, 81°.

Index error = — 1' 32".

Result of calculation.

True altitude.			Advance.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
47	20	48	1	51	56	41	22	03



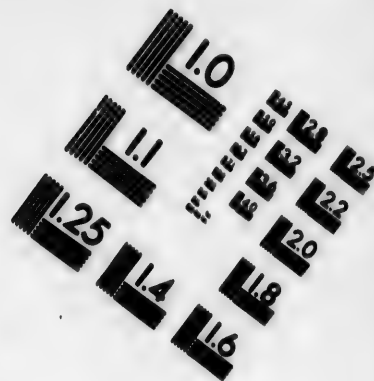
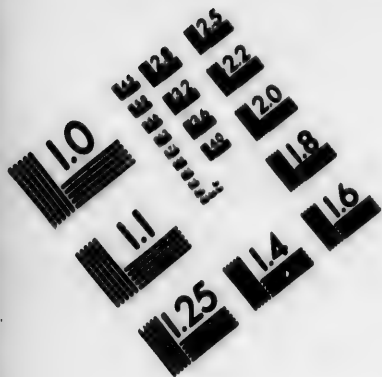
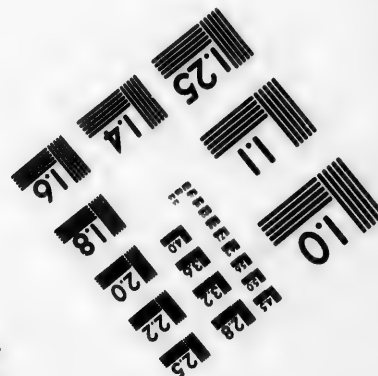
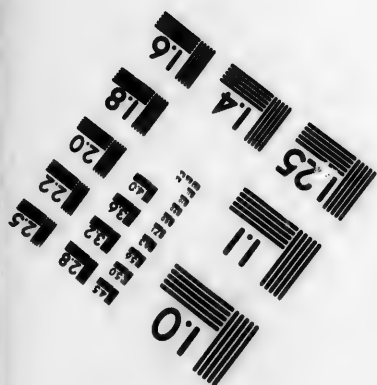
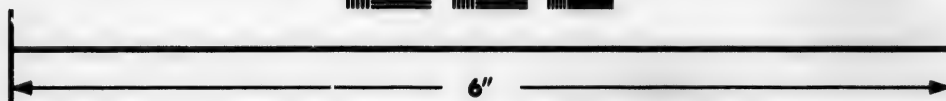
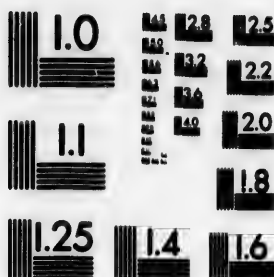


IMAGE EVALUATION TEST TARGET (MT-3)



Photographic Sciences Corporation

**23 WEST MAIN STREET
WEBSTER, N.Y. 14580
(716) 872-4503**

18 20 22 24

10 11 12 13 14 15 16 17

Noon halt on the left bank of the Platte river.

DETERMINATION OF LATITUDE.

September 28, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
92	42	30	1	29	09
92	45	45	1	31	33
92	47	50	1	33	42
92	49	00	1	35	35
92	49	20	1	36	55
92	50	10	1	38	50
92	49	25	1	41	29
92	48	45	1	42	32
92	48	15	1	43	33
92	47	20	1	45	10
92	46	10	1	46	18
92	44	35	1	47	51
92	41	20	1	49	51

Thermometer, 76°.

Index error = — 1' 32".

Result of calculation.

True altitude.	Mean time.	Latitude.
.....		

Encampment on the left bank of the Platte river, at the mouth of Elk Horn river.

DETERMINATION OF LATITUDE.

September 28, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	05	25	10	41	47
84	07	30	10	44	02
84	09	20	10	46	57
84	10	40	10	48	45
84	09	50	10	50	24
84	11	15	10	52	29
84	12	55	10	54	23
84	16	20	10	57	08
84	15	55	10	58	53
84	15	55	11	00	37

Thermometer 54°.

Index error = — 40''.

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	04	23	9	02	17	41	09	34

Encampment on the left bank of the Platte river, at the mouth of the Elk Horn river.

DETERMINATION OF TIME.

September 26, 1842.—Altitude of a Lyrae.

Observations.

Double altitude of a Lyrae.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
95	10	20	11	24	36
98	32	10	11	26	23.7
97	48	20	11	28	23
96	52	40	11	30	58
96	59	30	11	32	56

Thermometer, 54°.

Index error = — 40".

Result of calculation.

Mean time.			Advance.			Longitude.
h.	min.	sec.	h.	min.	sec.	
9	39	25	1	49	15	.....

the mouth of the

Encampment on the left bank of the Platte river.

DETERMINATION OF LATITUDE.

September 29, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
83	40	30	10	21	37
83	42	35	10	24	20
83	44	10	10	26	37
83	45	05	10	28	46
83	46	00	10	30	51
83	48	20	10	33	19
83	50	40	10	35	24
83	52	45	10	39	41
83	53	50	10	41	22
83	54	40	10	43	18

Thermometer 40°.

Index error = — 1' 38".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	52	05	8	43	56	41	02	15

Longitude.

.....

Encampment at Bellevue, on the right bank of the Missouri river, at the trading post of the American Fur Company.

DETERMINATION OF LONGITUDE.

October 2, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the Sun's lower limb.			Time of chronometer.			Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
48	39	45	19	07	07.5	49	49	25	10	10	49.8
48	48	20	10	08	04.0	49	59	00	10	11	18.6
49	09	10	10	09	06.6	50	05	00	10	12	00.4
49	20	50	10	09	42.8	50	15	05	10	12	30.4
49	30	10	10	10	10.5	50	24	55	10	13	00.0

Index error, = $-1' 38''$.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
8	21	41.5	1	48	41.6	95	47	46

DETERMINATION OF LATITUDE.

October 2, 1842.—Altitude of the Sun in the meridian.

Observations.

Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
89	58	10	1	32	56
89	58	55	1	33	35
89	59	20	1	34	20
90	00	05	1	36	07
89	59	55	1	36	55
89	59	45	1	38	31
89	59	40	1	39	32
89	59	10	1	40	27
89	59	10	1	41	17
89	58	25	1	42	26
89	57	30	1	43	21
89	55	20	1	45	52

Missouri river, at the
mouth.

Encampment at Bellevue, on the right bank of the Missouri river, at the trading post of the American Fur Company—Continued.

DETERMINATION OF LONGITUDE.

October 3, 1842.—Altitude of the Sun.

SERIES.

Time of chronometer.

h.	min.	sec.
10	10	49.8
10	11	18.6
10	12	00.4
10	13	30.4
10	13	00.0

FIRST SERIES.			SECOND SERIES.		
Double altitude of the Sun's lower limb.			Double altitude of the Sun's lower limb.		
Time of chronometer.			Time of chronometer.		
deg.	min.	sec.	deg.	min.	sec.
39	49	00	38	34	55
39	29	40	38	23	20
39	07	20	38	10	00
38	56	30	37	57	35
38	45	50	37	46	10
h.	min.	sec.	h.	min.	sec.
5	33	13.0	5	36	53.0
5	34	12.3	5	37	25.8
5	35	16.2	5	38	03.8
5	35	48.3	5	38	40.0
5	36	19.0	5	39	13.7

Index error = $-1' 38''$.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
3	46	52	1	49	38.5	.....		

Latitude.

min. sec.
47 46

DETERMINATION OF LONGITUDE.

October 4, 1842.—Altitude of the Sun.

Observations.

Meridian.

FIRST SERIES.			SECOND SERIES.		
Double altitude of the Sun's lower limb.			Double altitude of the Sun's lower limb.		
Time of chronometer.			Time of chronometer.		
deg.	min.	sec.	deg.	min.	sec.
48	11	10	49	16	50
48	28	30	49	23	45
48	42	50	49	30	30
49	00	10	49	37	00
49	09	05	49	45	05
h.	min.	sec.	h.	min.	sec.
10	10	20.0	10	13	42.0
10	11	14.0	10	14	04.4
10	11	57.3	10	14	22.6
10	12	51.0	10	14	46.0
10	13	19.0	10	15	11.0

Index error = $-1' 35''$.

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
8	23	17.6	1	49	53.2	95	47	46

Encampment at Bellevue, on the right bank of the Missouri river, at the trading post of the American Fur Company.—Continued.

DETERMINATION OF LATITUDE.

October 4, 1842.—Sun's altitude in the meridian.

Observations.

Double altitude of the Sun's lower limb.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
88	20	10	1	28	21
88	25	30	1	33	23
88	25	50	1	34	14
88	26	45	1	35	27
88	26	45	1	38	10
88	27	25	1	40	09
88	26	40	1	41	47
88	26	00	1	42	23
88	25	45	1	43	06
88	24	25	1	44	59
88	22	40	1	46	28
88	21	40	1	47	21
88	19	30	1	48	44

Result of calculation.

True altitude.	Mean time.	Latitude.
.....		

uri river, at the
Continued.

*Encampment on the left bank of Missouri river, opposite to the right bank
of the mouth of the Platte river.*

DETERMINATION OF LATITUDE.

October 4, 1842.—Altitude of Polaris.

Observations.

Double altitude of Po- laris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
84	11	10	10	51	29
84	11	50	10	53	26
84	14	50	10	56	31
84	16	30	10	59	47
84	18	25	11	03	54
84	20	00	11	05	48
84	20	25	11	07	39
84	21	30	11	10	54
84	23	40	11	13	18
84	24	50	11	15	15

Thermometer, 63°.

Index error = — 1' 21".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
42	07	29	9	13	17	41	02	19

Encampment on the right bank of the Missouri river.

DETERMINATION OF LATITUDE.

October 5, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
82	28	00	9	37	28
82	30	00	9	40	55
83	32	40	9	43	55
83	35	10	9	47	51
83	37	40	9	51	13

Thermometer, 69°.

Index error = — 1' 21".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	14	37	7	53	30	40	34	08

Noon halt at Bertholet's island, Missouri river.

DETERMINATION OF LATITUDE.

October 6, 1842.—Altitude of the Sun in the meridian.

Double altitude of the Sun's lower limb.			True central altitude.			Latitude.		
deg.	min.	sec.	deg.	min.	sec.	deg.	min.	sec.
88	16	55	44	22	55	40	27	08

Index error, = — 1' 35".

Encampment on the left bank of the Missouri river, mouth of the Niangua river.

DETERMINATION OF TIME.

October 6, 1842.—Altitude α Aquilæ.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of α Aquilæ.			Time of chronometer.			Double altitude of α Aquilæ.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
90	07	10	10	5	04.3	87	29	55	11	03	24.4
89	37	20	10	56	40.0	87	00	30	11	04	52.0
89	09	15	10	58	06.0	86	30	25	11	06	26.0
88	42	11	10	59	37.0	86	07	00	11	07	41.0
88	08	30	11	01	20.0	85	33	40	11	09	18.6

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.			
9	11	50	1	50	24	.....		

Encampment on the left bank of the Missouri, quarter of a mile below the mouth of Nishnabotona river.

DETERMINATION OF LATITUDE.

October 6, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
89	29	00	10	18	50
89	23	20	10	15	06
89	24	25	10	17	04
89	26	25	10	18	55
89	27	35	10	20	30
89	27	40	10	22	02
89	29	55	10	24	00
89	31	35	10	27	13
89	32	30	10	29	42
89	33	40	10	31	50

Thermometer, 47°.

Index error = — 1' 35".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
41	12	03	6	31	33	40	16	40

mile below the

Encampment on the left bank of the Missouri river.

DETERMINATION OF LATITUDE.

October 8, 1842.—Altitude of Polaris.

Observations.

Double altitude of Polaris.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
80	46	30	9	44	24
80	49	00	9	48	00
80	50	45	9	51	17
80	52	25	9	53	31
80	51	50	9	54	31
80	54	35	9	58	30
80	57	30	10	00	36
80	57	40	10	00	34
81	00	25	10	05	32
81	03	10	10	08	31

Thermometer, 36°.

Index error, = - 1' 21".

Result of calculation.

True altitude.			Mean time.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
40	25	29	9	07	10	39	36	02

itude.

min. sec.
16 40

Halt at the mouth of the Kansas river, 700 feet above the level of the Gulf of Mexico.

DETERMINATION OF LONGITUDE.

October 10, 1842.—Altitude of the Sun.

Observations.

FIRST SERIES.						SECOND SERIES.					
Double altitude of the lower limb of the Sun.			Time of chronometer.			Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.	h.	min.	sec.
39	08	15	9	44	35.0	40	21	35	9	48	06.0
39	27	50	9	45	31.0	40	31	50	9	48	36.0
39	44	30	9	46	17.5	40	41	00	9	49	02.3
39	57	50	9	46	59.0	40	51	10	9	49	31.0
40	00	28	9	47	31.0	41	00	10	9	49	59.5

Index error = — 1' 07".

Result of calculation.

Mean time.			Advance.			Longitude.		
h.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
7	59	09	1	48	28	94	32	54

vel of the Gulf

Halt at the mouth of the Kansas river, 700 feet above the level of the Gulf of Mexico.—Continued.

DETERMINATION OF LATITUDE.

October 10, 1842.—Sun's altitude in the meridian.

Observations.

ATES.

me of chronometer.

h.	min.	sec.
9	48	06.0
9	48	36.0
9	49	02.3
9	49	31.0
9	49	59.5

Double altitude of the lower limb of the Sun.			Time of chronometer.		
deg.	min.	sec.	h.	min.	sec.
87	41	10	1	21	01½
87	44	15	1	22	37
87	46	50	1	24	36
87	49	50	1	26	07
87	51	20	1	27	45
87	55	15	1	32	36
87	55	30	1	34	05
87	54	30	1	38	30
87	53	10	1	41	07
87	51	15	1	43	11
87	49	05	1	44	56
87	46	15	1	46	40
87	43	20	1	48	35
87	38	30	1	50	51

ude.

sec.
54

Result of calculation.

True altitude.			Time of transit by chronometer.			Latitude.		
deg.	min.	sec.	h.	min.	sec.	deg.	min.	sec.
44	12	24	1	35	42	39	06	03

☞ *The foregoing observations are given in civil time.*

ME

METEOROLOGICAL OBSERVATIONS.

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REMARKS.

The elevations which have been given in the course of the preceding report, are founded upon the annexed barometrical observations, and it is scarcely necessary to say are offered only as the best indications we have. The barometers were compared with those of Dr. G. Engelman, of St. Louis, Missouri, whose observations are given for a corresponding period. The following is the result of forty comparative observations of three barometers instituted by him from May 22d, to May 29th, 1842, at St. Louis. Range of barometers during that period 0".400, temperature 60° to 75°.

Barometer E, as observed for and noted in the journal of the academy :

— Fremont's Troughton (T.) — 0".136 — Fremont's Carey (C.) — 0".178.

Range in the differences :

Mean E	=	Fremont's Troughton (T.)	— 0".136	=	Fremont's Carey (C.)	— 0".178.
Minimum	=	"	— 0".116	=	"	0".167.
Maximum	=	"	— 0".150	=	"	0".190.
Range	=	"	0".034	=	"	0".023.

In the annexed observations, the barometers, Troughton and Carey, are designated respectively by the letters T. and C. In calculation the observations at the upper stations were referred to the *single* corresponding observation for the relative period of time at the lower station. It would perhaps have been better to refer to the mean of the observations for the month at the lower station. In calculation, the tables used were those of Bessel and of Oltmanns, as given in Humboldt.

On the road from the mouth of the Kansas to Fort Laramie.

Date.	Hour.	T.	Attached thermometer.	C.	Attached thermometer.	Temperature of the air.	Remarks.
1849. Camp of June 8-10	A. min.						
	8 30 A. M.	29.172	63.3	29.160	64.0	59.0	Very cloudy.
	9 30	29.154	63.5	29.140	67.5	60.7	Entirely overcast.
	12 30 P. M.	29.220	69.0	29.205	75.4	69.2	Some few clouds.
	4 30	29.150	77.7	29.150	83.5	76.0	
	6 6	29.141	74.0	29.130	77.8	73.4	
	9 9	29.154	68.0	29.154	72.0	66.2	
	5 5 30 A. M.	29.169	57.5	29.155	60.5	54.0	
	7 7	29.252	72.5	29.250	79.25	73.0	
	1 1 P. M.	29.263	81.7	29.294	88.0	78.0	
Camp of June 10-11	4 30	29.240	83.0	29.237	89.0	85.0	Perfectly clear; very fresh breeze from S. 65° W.
	6 30	29.211	75.7	29.210	80.7	75.0	Perfectly clear; pleasant breeze from SW.
	7 7	29.272	55.0	29.260	58.5	57.0	Clear.
	6 30 P. M.	29.040	75.0			72.0	
	10 5 A. M.	29.063	57.0			54.0	Night clear and calm.
	6 6	29.052	54.7			56.0	Cloudy. Wind ENE.
	12 Noon halt.....	29.983	76.0			55.7	Light breeze, with occasional thunder and lightning.
	8 8 P. M.	29.792	69.0	28.805	77.7		Bright and clear. Wind tolerably strong from SE.
	10 10	28.814	64.7	28.767	72.3	71.4	Calm. Stars overhead, and clouds in the horizon, with occasional thunder and lightning.
				28.765	67.0		Entirely clouded. Wind W. 10° N.
Camp of June 12-13	7 7 A. M.	28.902	58.7	28.867	62.4	61.0	Clear. Few clouds in the North.
	8 8 P. M.	29.000	62.0			64.7	Clear. Wind fresh from NW.
	10 10	29.032	56.2			54.5	Light wind from NW.
	6 6 A. M.	29.044	55.0			50.3	Bright sun. Slight breeze at intervals from West.
Camp of June 13-14	1 1 P. M.	29.000	73.0				Calm and cloudy.
	7 7	29.010	72.0				
	6 6 A. M.	28.963	66.0			57.3	
	9 9 A. M.	29.034	56.0	29.005	70.4		
Camp of June 14-16	10 10 30 P. M.	29.032	70.0	29.000	76.5	71.5	
	4 4 30 P. M.	28.974	76.0			75.0	
	7 7 30	28.950	70.5			73.0	

Camp of June 16-18	10 10	29.970	55.0			66.4	Calm, cloudy, and sun at intervals.
	5 5 A. M.	28.924	60.5			60.5	Clear. A few white clouds in the horizon.
	13 13 30 P. M.	29.012	78.3			81.4	

Clear. Wind fresh from NW.
Light wind from NW.
Bright sun. Slight breeze at intervals from West.
Calm and cloudy.

Noon halt.....	10	6	A. M.	29.032	56.9	.....	.....	.....	54.5
Camp of June 13-14	1	6	P. M.	29.044	55.0	.....	.....	.....	59.3
	7	6	P. M.	29.000	73.0	.....	.....	.....	.....
Camp of June 14-16	6	6	A. M.	29.010	72.0	.....	.....	.....	57.3
	7	6	A. M.	29.962	56.4	.....	.....	.....	.....
	9	6	A. M.	29.034	66.0	.....	.....	.....	71.5
	10	30	A. M.	29.022	70.0	.....	.....	.....	.....
	4	30	P. M.	29.974	76.0	.....	.....	.....	75.0
	7	30	P. M.	29.930	70.5	.....	.....	.....	72.0

Camp of June 16-18									
10	5	10	A. M.	28.370	66.0	.....	.....	.....	66.4
12	30	11	P. M.	28.924	60.5	.....	.....	.....	60.5
4	30	11	P. M.	29.012	78.3	.....	.....	.....	81.4
7	11	11	P. M.	28.941	78.0	.....	.....	.....	80.0
11	6	30	A. M.	28.930	76.5	.....	.....	.....	80.0
				28.902	66.0	.....	.....	.....	66.0
				28.681	63.0	.....	.....	.....	73.0
10	30	10	P. M.	28.844	80.3	.....	.....	.....	78.2
11	30	11	P. M.	28.822	81.0	.....	.....	.....	84.0
1	5	1	P. M.	28.813	78.0	.....	.....	.....	79.6
5	6	5	P. M.	28.763	73.0	.....	.....	.....	69.7
Sunset.....				28.712	66.0	.....	.....	.....	65.5
				28.733	63.5	.....	.....	.....	64.0
A. min.						.....	.....	.....	
10	10	10	P. M.	28.744	62.0	.....	.....	.....	63.0
7	7	7	A. M.	28.762	56.7	.....	.....	.....	56.5

Calm, cloudy, and sun at intervals.
Clear. A few white clouds in the horizon.
Sky covered with white clouds. Wind West.
Clear.
Sky covered with thin white clouds. Wind West.
A moderate breeze. Some clouds, especially near the horizon. Wind S. 10° E.
Sun and clouds. Strong breeze from S. 20 E.
Clouds; stronger breeze.
Sky covered with heavy clouds.
Thunder in the NW. Clouds.
Heavy and dark. Wind moderate from South.
Leadly calm; raining steadily. Sky of a uniform leaden appearance. Thunder frequent and long continued, seeming to travel over all the sky.
Light wind from North. Brilliant sunset. Masses of clouds in the sky. Dark in E. Wind N. slight, cloudy.
Cold wind from the North.

On the road from the mouth of the Kansas to Fort Laramie—Continued.

Date.	Hour.	T.	Attached thermometer.	Temperature of the air.	Remarks.
Camp of June 18-19.....	7 P. M.....	28.845	64.5	64.0	
	10 P. M.....	28.891	51.0	49.0	
Noon halt of June 19.....	30' A. M.....	28.982	46.5	45.0	Perfectly clear. Light breeze from NW.
Camp of June 19-20.....	2 P. M.....	28.861	70.0	.....	
	6 30' P. M.....	28.502	65.0	77.0	
	10 30' P. M.....	28.483	49.0	46.5	
Noon halt of June 20.....	6 30' A. M.....	28.490	47.5	54.3	Lt breeze from S. Sun bright. Few clouds in zenith and N.
Camp of June 20-21.....	2 30' P. M.....	28.544	76.0	.....	Clear and bright. Wind fresh from S. 10° E.
	7 P. M.....	28.711	77.0	75.0	
	10 P. M.....	28.691	60.0	60.0	Wind S. Thin white clouds stretched about the sky.
Noon halt of June 21.....	6 35' A. M.....	28.613	63.0	63.7	Sun and cloudy. Wind S. 10° E.
Camp of June 21-22.....	1 30' P. M.....	28.531	84.5	.....	Wind Strong from W. Sun bright.
	7 P. M.....	28.371	78.5	77.0	
	7 30' P. M.....	28.363	75.0	.....	Wind quite fresh from S. 8° W. Appearance of rain.
	10 30' P. M.....	28.363	69.5	70.8	High wind from S. Cloudy.
	5 30' A. M.....	28.344	66.6	60.0	High wind from E. Cloudy.
Noon halt of June 22.....	12 30' P. M.....	28.513	83.5	.....	Bright sun at intervals.
Camp of June 22-23.....	6 30' A. M.....	28.471	63.7	.....	Cloudy, with appearance of rain. Wind NW.
Noon halt of June 23.....	2 P. M.....	28.000	94.2	.....	Blowing a gale from S. 30° E.
Camp of June 23-24.....	6 30' P. M.....	28.330	80.8	84.3	
	10 P. M.....	28.280	68.5	69.5	Wind ESE fresh, cloudy. A few stars visible.
	Sunrise.....	28.191	63.7	65.0	Wind strong from S. 30° E.
	6 A. M.....	28.180	64.6	66.5	Heavily clouded.
Camp of June 24-25.....	Sunset.....	27.875	83.0	82.7	Wind S. 30° E., fresh. Sky clear in zenith. Heavy clouds in the W.
	5 A. M.....	28.004	63.5	63.5	Clear. Pleasant breeze from N. 10° E.
	5 30' A. M.....	28.002	63.8	67.3	
Noon halt of June 25.....	6 A. M.....	28.012	65.2	70.2	Clear. Wind light from N. 10° E.
Camp of June 25-26.....	2 P. M.....	28.020	89.0	.....	Clear. Wind moderate from NE.
	7 P. M.....	27.983	79.8	81.0	Clear, with light wind from NE.
	Sunset.....	27.970	73.5	71.3	Clear and calm. Sun set in a bank of clouds.
	6 A. M.....	28.114	61.0	64.0	Sun and clouds. Wind strong from N.

Noon halt of June 26.....	12 M.....	28.034	67.5	.....	Squalls of rain, heavy thunder and lightning.
Camp of June 26-27.....	Sunset.....	27.934	68.8	.....	Clear and calm.
	11 P. M.....	27.912	55.0	55.0	Clear. Light air from S.
	.....	.....	53.0	53.0	.....

heavily clouded.
Wind E. 30° E., fresh. Sky clear in south. Heavy clouds in the W.
Clear. Pleasant breeze from N. 10° E.
Clear. Wind light from N. 100° E.
Clear. Wind moderate from NE.
Clear, with light wind from NE.
Clear and calm. Sun set in a bank of clouds.
Sun and clouds. Wind strong from N.

80.3
82.7
63.5
67.3
70.2
81.0
71.3
64.0

04.0
83.0
63.5
63.8
63.8
65.2
89.0
79.8
73.5
61.0

Sunset.....
5 A. M.....
5 30' A. M.....
6 A. M.....
2 P. M.....
7 P. M.....
Sunset.....
6 A. M.....

Camp of June 24-25.....
Noon halt of June 25.....
Camp of June 25-26.....

Squalls of rain, heavy thunder and lightning.
Clear and calm.
Clear. Light air from S.
Cloudy. Light air from N.
Cloudy. Light wind from S.
Rain ceased, sun shining, and sky partially clear. Wind moderate from S.
Calm, cloudy; bright sunset; banks of clouds in W.
Cloudy in the horizon; lightning in N.; light wind from E.
Many light clouds on a blue sky; sun bright; calm.
Light breeze from N.
Clear, except in the horizon.
Clear in the zenith; lightning in N.; clouds on the whole horizon; wind S.
Cloudy; wind light from N. 30° W.
Wind E.; sun; blue sky and cumuli.
Wind fresh from E.
Cloudy; wind increasing; now violent gale from N. 30° W., with rain.
Cloudy, except in W.
Strong wind from NW.; clearing off.
Slight breeze from W 30° S.; eastern sky clouded.
Sun and clouds; wind W. 30° S.
Wind strong, N. 50° W.; sun and clouds.
Wind strong, N. 50° W.; sun and clouds.
Clear; wind fresh from N. 50° W.
Light wind from N. Clear, except a few clouds over the setting sun.

67.5
68.8
55.0
60.0
63.0
65.0
71.0
63.5
57.0
69.0
84.3
69.5
68.3
53.3
57.8
62.7
68.8
58.6
43.0
49.0
55.2
65.5
51.0
46.0
49.0
51.0
68.0

28.034
27.934
27.912
27.880
27.921
27.932
27.933
27.871
27.730
27.683
27.651
27.660
27.633
27.324
27.302
27.373
27.362
27.381
27.473
27.454
27.493
27.594
27.611
27.552
27.533
27.521
27.513
27.492
27.450
27.450
27.209
27.193
27.163
27.162
27.171
27.194
27.173

12 M.....
Sunset.....
11 P. M.....
6 A. M.....
7 A. M.....
8 A. M.....
12 M.....
2 P. M.....
Sunset.....
10 30' P. M.....
Sunrise.....
6 A. M.....
9 A. M.....
Sunset.....
10 P. M.....
6 A. M.....
12 M.....
2 P. M.....
6 P. M.....
Sunset.....
9 P. M.....
Sunrise.....
6 A. M.....
12 M.....
9 P. M.....
6 30' P. M.....
Sunset.....
10 30' P. M.....
6 A. M.....
Sunset.....
9 30' P. M.....
5 A. M.....
5 30' A. M.....
6 A. M.....
2 P. M.....
7 P. M.....

Noon halt of June 26.....
Camp of June 26-27.....
Noon halt of June 27.....
Camp of June 27-28.....
Camp of June 28-29.....
Noon halt of June 29.....
Camp of June 29-30.....
Noon halt.....
Camp of June 30 and July 1.....
Camp of July 1-2.....
Noon halt of July 2.....
Camp of July 2-3.....

Foggy, sun shining as through a mist, and light air from N.
Wind tolerably strong from NW.; sun and amoky.
Wind light from N.

68.0

68.0

68.0

68.0

On the road from the mouth of the Kansas to Fort Laramie—Continued.

Date.	Hour.	T.	Attached thermometer.	Temperature of the air.	Remarks.
Camp of July 2-3.	Sunset	97.160	65.5	63.4	Calm, dirty horizon, otherwise clear. Clear, light wind from NW. Sun and little smoky, calm; very smoky, wind light from S.
	10 30 P. M.	97.151	51.0	47.0	
	7 A. M.	97.203	57.0	55.6	
Noon halt of July 3.	1 P. M.	97.103	79.0		Smoky, wind moderate from S. Smoky and cloudy; wind light from S. Wind light from S. 78° W.; sun shining red as through a thick fog.
	2 P. M.	97.064	84.5	.....	
	Sunset	96.924	71.0	.....	
Camp of July 3-4.	10 P. M.	96.890	64.0	54.5	Smoky, sky entirely covered; wind tolerably strong from N 75° W. Same smoky sky, wind moderate from N. Same sky, wind light from N. Sun from between clouds, has been raining; wind E. 15° S.
	5 30 A. M.	96.831	51.6	.....	
	6 A. M.	96.832	53.3	54.5	
Noon halt of July 4.	12 30 P. M.	96.823	76.0		Same smoky sky, wind moderate from N. Same sky, wind light from N. Sun from between clouds, has been raining; wind E. 15° S.
	5 30 P. M.	96.831	69.0	69.0	
	6 P. M.	96.894	67.3	67.2	
Camp of July 4-5.	9 30 P. M.	96.831	53.3	59.6	
	6 30 A. M.	96.894	59.5	59.0	

On the road from the mouth of the Kansas to Fort Laramie—Continued.

Date.	Hour.	T.
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On the road from the mouth of the Kansas to Fort Laramie—Continued.

Date.	Hour.	C.	Attached thermometer.	Remarks.
Camp of July 5-6.....	Sunset.....	26.485	66.0	Sky clear; wind S. 67° E.
Noon halt of July 6.....	6 A. M.....	26.455	55.5	Sky clear; high wind from S.
Camp of July 6-7.....	12 P. M.....	26.235	89.2	Cloudy; a gale from W.
Noon halt of July 7.....	Sunset.....	26.010	81.5	Clear; wind high from SW. Specially, and high wind with rain.
Camp of July 7-8.....	6 A. M.....	26.183	69.0	Nearly calm; light air from S. 70° W. Clear.
Noon halt of July 8.....	12.....	26.192	103.4	Wind strong from S. 90° E.; masses of clouds.
Camp of July 8-9.....	Sunset.....	25.950	81.4	Wind fresh from S. 50° E.; sun and a few clouds.
Noon halt of July 9.....	6 A. M.....	25.970	70.0	Sun; calm and clear.
Camp of July 9-10.....	12 M.....	25.920	108.0	Sun a little faint, sometimes obscured by long white clouds.
Noon halt of July 10.....	12 30' P. M.....	25.373	90.5	Calm; sun and clouds.
Camp of July 10-11.....	6 30' A. M.....	25.100	77.5	Calm; sun and clouds.
Noon halt of July 11.....	12 M.....	25.064	79.7	Calm; sun and clouds.
Camp of July 11-12.....	9 A. M.....	25.042	84.0	Sun and clouds; wind moderate from N. 65° E.
Noon halt of July 12.....	4 30' P. M.....	25.010	85.1	Cloudy; wind moderate from N. 65° E.
Camp of July 12-13.....	6 30' P. M.....	25.011	80.0	Sun and clouds; wind moderate from E.
Noon halt of July 13.....	6 A. M.....	25.253	76.0	Sun and clouds; wind moderate from E.
Camp of July 13-14.....	8 A. M.....	25.305	77.0	Sun and clouds.
Noon halt of July 14.....	2 P. M.....	25.417	86.0	Clear except in E.; wind light from N.
Camp of July 14-15.....	Sunset.....	25.521	66.0	Sun; blue sky and clouds. Light wind from W.
Noon halt of July 15.....	6 A. M.....	25.925	59.8	Clear; fresh wind from S. 50° E. Wind fresh from S. 50° E.
Camp of July 15-16.....	Sunset.....	24.862	67.7	Sun; a few clouds in the horizon.
Noon halt of July 16.....	6 A. M.....	24.830	60.6	Sun and clouds; wind moderate from S.
Camp of July 16-17.....	2 P. M.....	25.050	103.6	Light clouds all over the sky, and heavy dark ones in the W. Wind moderate from S. 30° E.
Noon halt of July 17.....	Sunset.....	25.520	80.0	Sun and clouds; wind fresh from S. 10° W.
Camp of July 17-18.....	6 A. M.....	25.515	71.6	Clear; a few clouds in the W. horizon. Wind W.
Noon halt of July 18.....	6 30' A. M.....	25.862	74.3	

Fort Laramie.

Date.	Hour.	T.	Attached thermometer.	C.	Attached thermometer.	Temperature of the air.	Wet bulb.	Remarks.
July 16	9	25.601	67.5					
	12	25.754	69			52.5		Cloudy; strong west wind.
	4	25.744	72.2			50.3		sun and clouds; light wind, W. 10° S.
	6	25.734	63.5			55		Entirely clouded; moderate wind, S. 60° W.
17	9	25.761	78.7			50.4		Entirely clouded; moderate wind, S. 60° W.
	7	25.842	72.6			74	50.5	Cloudy; wind light, NW; pale from S during night.
	9	25.853	76.3			71	66.1	do
	12	25.840	91.8			56	71	do
18	4	25.771	66.7			50		Wind N. 60° E.
	Sunset.	25.752	70.5			65	60	Wind N. 60° E.; rain in W.; thunder and lightning.
	6	25.803	63.5			64.5	61.5	Cloudy; calm.
	9	25.800	62			59.8		Moderate wind W.; showers, with thunder and lightning.
19	10	25.863	63					Light air from SW.; cloudy.
	11	25.861	67			73	66	Wind light from S.
	12	25.900	73.6			80	66.5	Wind moderate, S. 10° E.
	3	25.843	76.6			80		Wind E.; moderate.
20	5	25.835	80.6			78.3		do
	6	25.832	78.5			73.6		Calm.
	7	25.840	75			63		Light wind from E.
	10	25.862	64.2			68.5		Calm and clear.
19	6	25.900	64.5			67		
	8	25.904	73.2					E. wind fresh; sun and clouds.
	10	25.913	84			81	65.5	Wind light E.; sun and clouds.
	12	25.891	82.3			78	65	Rain in twilight; wind very fresh E.
20	5	25.812	75.8			73	64	Wind moderate E. 10° E.; cloudy.
	7	25.813	71.5					High wind from E.
	9	25.850	65			68		Light E. wind; cloudy.
	6	25.811	61.3			79	69	Wind fresh from E.; apparently of rain.
20	9	25.842	82.6			95	70	Wind very fresh from E.; cloudy.
	12	25.791	85.4			94		Wind SE.; very fresh; raining in squalls more than;
	5	25.753	70.2			75	64	lighty thunder and lightning.
	6	25.734	81.7			65.5		Calm.

Observations among the Wind River mountains.

Observations among the Wind River mountains.

Station and date.	Hour.	T.	Therm.	Remarks.
Island Lake of August 13	5.30 P. M.	20.532	55	Wind South; clear sky.
.....Do.....do.....	Sunset	20.522	50	Wind South; at dusk, a gale from NW, continued till late in the night.
.....Do.....August 14.....	Between daylight and sunrise ...	20.572	29	Wind South, sky bright.
In a gap of the central chain, of August 14.....	Noon.....	19.401	50	Wind South 40° W.; bright, with clouds.
Camp at Island Lake of August 14.	5 P. M.	20.643	55.5	Wind light from South; blue sky, much covered with heavy masses of cumuli.
.....Do.....do.....	Sunset	20.641	50	Wind South, but the cumuli come over the mountains from N.
.....Do.....August 15.....	Between daylight and sunrise ...	20.663	40.3	Sky clear; calm.
.....Do.....do.....	6 A. M.	20.672	40.3	Do
Lake below the summit, August 15.	9 A. M.	20.450	70.5	Wind N.; clear, some cumuli.
Highest point of the Wind River chain, of August 15.....	1 P. M.	18.328	45.3	Wind South 35° W.; clear and clouds.
chain of August 15.....	1 P. M.	18.293	44	Do
Camp at Island Lake, of August 15.	Sunset	20.612	52	Wind N.; some clear cumuli.
.....Do.....do.....August 16.	Between daylight and sunrise...	20.651	41.5	Do

20	5	25.812	75.8	25.575	76	65	Rain in spots; wind very light.
	7	25.813	71.5	25.765	73	64	Wind moderate S. 70° E.; clear.
	9	25.850	65	25.803	68	63	High wind from E.
	6	25.811	61.3	25.760	69	63	Light E. wind; cloudy.
	9	25.842	82.6	25.803	73	69	Wind fresh from E.; cloudy.
	12	25.791	85.4	26.070	95	70	Wind very fresh from E.; appearance of rain.
	5	25.733	70.2	26.105	75	64	Wind SE; very fresh; raining in spots more than elsewhere.
	6	25.724	81.7	26.166	.....	.....	[Heavy shower and lightning.]

Register of meteorological observations made by Dr. G. Engelmann, at St. Louis, Missouri.

Barometer (E.) 60 feet above low water mark of the Mississippi, or, according to Mr. Nicollet's observations, 442 feet above the Gulf of Mexico.

Date.	Hour.	Barometer.	Thermometer.		Wind.	Rain.	Memoranda.
			Attached.	Free.			
1842. June	1 Sunrise	29.31	Degrees.	Degrees.	E.	Inches.	Nearly clear.
	9	29.28	72	56	SE.	0.10	Do
	12	29.27	75	76	SE.	.....	Do
	3	29.27	76	75	.....	.....	Beginning to rain; thunder.
	9	29.15	73	67	.....	.....	Clearing up.
2	1 Sunrise	29.08	.....	66	S.	0.86	Overcast.
	6	29.01	71	65	.....	.....	Heavy rain; thunder.
	9	29.01	72	75	.....	.....	Clouds; sunshine.
	12	28.91	75	80	SSE.	.....	Stormy; overclouded.
	3	28.79	77	83	S.	.....	Nearly clear; few clouds.
3	1 Sunrise	28.78	77	.....	SSW.	.....	Heavy storm beginning; hurricane at Athens, 40 miles SE.
	3	28.84	77	70	SW.	.....	Thunderstorm past.
	9	28.90	76	71	.....	.....	Distant thunder.
	12	29.15	71	66	WSW.	.....	Overclouded.
	3	29.17	74	68	WNW.	.....	Do
4	1 Sunrise	29.17	76	75	WNW.	.....	Clouds; sunshine.
	3	29.18	76	81	.....	.....	Nearly clear.
	9	29.23	77	71	SE.	0.06	Clear.
	12	29.17	82	65	SE.	.....	Nearly clear; a little hazy.
	3	29.13	85	87	SE.	.....	Do do
5	1 Sunrise	29.12	83	93	SSE.	.....	Do do
	3	29.12	83	81	.....	.....	Do light clouds.
	9	29.32	79	70	N.	.....	Overclouded. Thunderstorm, and rain at 11 o'clock.
	12	29.32	76	76	N.	.....	Overclouded.
	3	29.35	79	79.5	NNW.	.....	Clouds; sunshine.

3	.....	29.31	80	81	NW.	.....	Do
10	.....	29.33	74	67	NNW.	.....	Clear; windy.
6	Sunrise	.....	.....	59	N.	.....	.....

4	Sunrise	3..... 9.....	29.11 29.18	76 77	71 65	 SE. SE. SE. SSE. N. N. NNW.	 0.08	Clear. Nearly clear; a little hazy. Do do Do light clouds. Thunderstorm, and rain at 11 o'clock. Overclouded. Overclouded. Clouds; sunshine. Hazy; sun faint.
5	Sunrise	3..... 9..... 12.....	29.32 29.35	79 79	76 79.5	 N. NNW.	..... ..... .....	..... ..... .....
6	Sunrise	3..... 10..... 9..... 12..... 3..... 10.....	29.31 29.36 29.43 29.41 29.39 29.38	80 74 73 74 75 70	61 67 69 75 76 61	NNW. NNW. N. NE. NE. NE. NE. NE. NE. NNE. N. N.	..... ..... ..... ..... ..... ..... ..... ..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
7	Sunrise	3..... 9..... 12..... 3..... 10.....	29.29 29.36 29.43 29.41 29.37	70 70 66 65	57 61 60 57	NE. NE. NE. NE. NE. NNE. N. N.	..... ..... ..... ..... ..... ..... ..... .....	Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
8	Sunrise	3..... 9..... 12..... 3..... 10.....	29.35 29.37 29.36 29.35 29.35	64 66 69 68	63 71 74 61	NNW. NNW. N. NE. NE. NE. NNE. N. N.	..... ..... ..... ..... ..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
9	Sunrise	3..... 9..... 12..... 3..... 10.....	29.35 29.33 29.33 29.33 29.35	70 73 76 74	62 71 80 82 67	SW. NW. NW. NW. NW. W.	..... ..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
10	Sunrise	3..... 9..... 12..... 3..... 10.....	29.45 29.46 29.48 29.55 29.57	75 75 77 70 61	73 89 87 54 45	NW. NW. NW. NW. NE. E. E. SE.	..... ..... ..... ..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
11	Sunrise	3..... 9..... 12..... 3..... 10.....	29.55 29.55 29.51 29.45 29.34	67 70 74 71	63 71 77 62	SW. SW. W. NW. NW. NW. NW. NW.	..... ..... ..... ..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
12	Sunrise	3..... 9..... 12..... 3..... 10.....	29.29 29.30 29.31 29.35 29.43	72 72 73 71 72	62 76 70 62 56	SW. W. NW. NW. NW. NW. NW. NW.	..... ..... ..... ..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do
13	Sunrise	3..... 9..... 12..... 3..... 10.....	29.43 29.43 29.40 29.40	72 73 73 74	72 77 79	June	..... ..... ..... ..... .....	Do Clear; windy. Clear. Nearly clear. Do Do Do Overclouded; beginning to rain. Drizzling. Do Overclouded. Overcast. Do Do Clearing up; few clouds. Clear. Clouds; sunshine. Thunder storm. Clearing up. Clouds; sunshine; sultry. Clearing up. Clear. Do Do Clear; few clouds. Nearly clear. Clear. Nearly clear; clouds. Clear. Nearly clear. Some clouds. Clear. Nearly clear. Hazy; sun faint. Cloudy; a little rain. Cloudy. Clear. Clear, few clouds. Do Do

METEOROLOGICAL OBSERVATIONS AT ST. LOUIS—Continued.

Date.	Hour.	Barometer.	Thermometer.		Wind.	Rain.	Memoranda.
			Attached.	Free.			
1842. June	13	29.40	Degrees. 74	Degrees. 64	NW.	.....	Clear.
	14	29.39	.....	58	SW.	.....	Do
	9....	29.36	74	76	SE.	.....	Hazy.
	12....	29.36	75	81	SW.	.....	Nearly clear.
15	3....	29.34	77	82	SW.	.....	Clouds; sunshine.
	10....	29.32	75	67	.....	.....	Clouds; thunder clouds.
	Sunrise	.....	.....	64	SW.	.....	Clouds; sunshine.
	9....	29.35	76	73	SW.	.....	Do do
16	12....	29.32	77	85	SE.	.....	Nearly clear.
	3....	29.29	80	84	SE.	.....	Overclouded; drops of rain at sunset.
	10....	29.28	77	71	.....	.....	Cloudy.
	Sunrise	.....	.....	62	SW.	.....	Clear.
17	9....	29.33	79	77	SW.	.....	Cloudy; sunshine.
	12....	29.31	80	81.5	SW.	.....	Do do
	3....	29.29	82	85.5	WSW.	.....	Nearly clear.
	10....	29.31	80	71	WSW.	.....	Clear.
18	Sunrise	.....	.....	64	NE.	.....	Do
	9....	29.25	81	82	SE.	.....	Clouds; sunshine.
	12....	29.19	83	86	.....	.....	Do do
	3....	29.13	85	88	.....	.....	Heavy clouds; sunshine.
19	10....	29.11	82	75	S.	.....	Clouds; moonshine.
	Sunrise	.....	.....	72	W.	.....	Cloudy; drops of rain.
	9....	29.04	80	81	W.	0.04	Cloudy; sunshine.
	12....	29.07	83	77	NW.	.....	Some rain; some thunder.
19	3....	29.07	83	81	NW.	.....	Cloudy.
	12....	29.14	77	69	NW.	.....	Do
	Sunrise	.....	.....	59	NW.	.....	Clear.
	9....	29.22	71	68	NW.	.....	Do
20	12....	29.27	73	72	NW.	.....	Clear; few clouds.
	3....	29.31	75	74	NW.	.....	Do
	10....	29.36	71	63	NW.	.....	Clear; light clouds.
	Sunrise	.....	.....	55	NW.	.....	Cloudy; clearing up.
20	9....	29.43	73	73	NW.	.....	Clear.
	10....	29.36	71	63	NW.	.....	Clear; light clouds.
	Sunrise	.....	.....	55	NW.	.....	Cloudy; clearing up.
	9....	29.43	73	73	NW.	.....	Clear.

METEOROLOGICAL OBSERVATIONS AT ST. LOUIS—Continued.

Date.	Hour.	Barometer.	Thermometer.		Wind.	Rain.	Memoranda.
			Attached.	Free.			
1842 June	27	29.37	Degrees. 82	Degrees. 71	WNW.	Inches.	Clear.
	10	29.36	81	68	WNW.	.....	Do
	Sunrise		80	64	SW.	.....	Nearly clear.
	12	29.34	83	89	S.	.....	Somewhat hazy.
28	3	29.31	83	91	SSW.	.....	Nearly clear; some clouds.
	10	29.27	86	91	SSW.	.....	More clouds.
	10	29.28	84	77	.....	.....	Stars dim.
	Sunrise		82	74	S.	.....	Hazy; sun faint.
29	9	29.91	82	85	S.	.....	Clouds; sunshine.
	12	29.16	83	87	S.	.....	Cloudy; sunshine; wind.
	3	29.14	85.5	90	S.	.....	Nearly clear.
	10	29.13	83	80	.....	.....	Thunder; no rain; heavy thunder at night.
30	Sunrise		.....	66	.....	1.75	Some rain; cloudy.
	9	29.94	77	79	SSW.	.....	Clearing up.
	12	29.29	86	76	W.	.....	Sprinkling of rain; raining.
	3	29.30	81	73	WNW.	0.31	Overclouded; raining hard.
July	1	29.34	72	58	NW.	.....	Clear. Rain in the night.
	10		.....	58	W.	0.19	Overclouded; some rain.
	9	29.37	68	65	W.	0.11	Sprinkling of rain.
	12	29.38	69	67	W.	0.08	Raining.
2	3	29.35	68	67	NW.	.....	Overclouded.
	10	29.37	62	60	W.	.....	Clear.
	Sunrise		.....	56	SW.	.....	Do
	8	29.38	69	63	SW.	.....	Do
3	12	29.37	74	80	SSW.	.....	Do
	3	29.35	76	83	SSW.	.....	Do
	10	29.37	75	70	S.	.....	Do
	Sunrise		.....	67	SW.	.....	Hazy; sunshine.
4	9	29.43	74	76	W.	.....	Overclouded.
	12	29.45	77	83	W.	.....	Hazy; sunshine.

4	3	29.44	78	83	W.	.....	Do
	11	29.43	77	70.5	S.	.....	Nearly clear.
Sunrise	6	29.39	.....	68	.....	.....	Hazy; sun a yellow disk.

2	Sunrise	10....	29.37	62	56	W.	.....	Clear.
		81....	29.38	69	62	SW.	.....	Do
		12....	29.37	74	80	SW.	.....	Do
		3....	29.35	76	83	SSW.	.....	Do
		10....	29.37	75	70	S.	.....	Do
3	Sunrise	9....	29.43	74	67	SW.	.....	Hazy; sunshine.
		12....	29.45	77	76	W.	.....	Overclouded.
					63	W.	.....	Hazy; sunshine.
4	Sunrise	11....	29.43	77	83	W.	.....	Do do
		9....	29.39	75	70.5	S.	.....	Nearly clear.
		12....	29.34	78	68	S.	.....	Hazy; sun a yellow disk.
		3....	29.29	78	81	SSW.	.....	Do sun faint.
		11....	29.28	77	81	S.	.....	Do do
5	Sunrise	9....	29.30	74	70	SW.	0.04	Overclouded.
		12....	29.32	73	68	W.	.....	Hazy; some stars.
		3....	29.31	73	69	NW.	.....	Overclouded; thunder storm.
		10....	29.30	69	67	NNW.	.....	Overclouded; some rain.
6	Sunrise	9....	29.48	76	54	NE.	.....	Overcast.
		1....	29.46	73	54	NE.	.....	Do
		3....	29.44	72	67	NE.	.....	Overclouded.
		10....	29.43	69	54	E.	.....	Hazy; sunshine.
7	Sunrise	9....	29.36	73	71	SE.	.....	Do
		12....	29.38	73	83	SE.	.....	Do
		3....	29.32	81.5	85	SSE.	.....	Do
		10....	29.17	79	77	.....	0.38	Stars.
8	Sunrise	11....	29.26	77	58	WNW.	.....	Nearly clear.
		9....	29.30	76	71	NW.	.....	Do
		12....	29.33	75	63	NW.	.....	Cloudy; some sunshine.
		3....	29.35	74	69	NW.	.....	Nearly clear.
		10....	29.41	70	70	.....	.....	Heavy rain and thunder.
9	Sunrise	9....	29.50	71	57	NNW.	.....	Cloudy; sunshine.
		12....	29.49	72	71	NE.	.....	Sprinkling of rain.
		3....	29.46	73	77	NE.	.....	Cloudy.
		10....	29.45	71	64	ENE.	.....	Do
10	Sunrise	9....	29.50	74	63	SE.	.....	Overclouded.
		12....	29.51	76	78	SSE.	.....	Clear.
		3....	29.46	78	83	SE.	.....	Do
		10....	29.45	77	85	SE.	.....	Clear; few clouds.
11	Sunrise	9....	29.50	81	71	SE.	.....	Do
		12....	29.47	82	68	SE.	.....	Do
					83	SE.	.....	Do
					86	SE.	.....	Do

METEOROLOGICAL OBSERVATIONS AT ST. LOUIS—Continued.

Date.	Hour.	Barometer.	Thermometer.		Wind.	Rain.	Memoranda.
			Attached.	Free.			
1842.			Degrees.	Degrees.		Inches.	
July 12	10....	29.45	84	90	SE.	.....	Clear.
	Sunrise	29.42	81	74	SE.	.....	Do
	9....	29.45	78	69	SE.	.....	Do
	12....	29.41	82	85	SE.	.....	Do
13	3....	29.38	86	89	SE.	.....	few light clouds.
	10....	29.35	83	75	SE.	.....	Do
	Sunrise	29.39	82	84	SW.	.....	Sunshine; clouds.
	9....	29.39	84	84	SW.	.....	Do
14	12....	29.39	84	83	NW.	.....	Stormy; thunder storm.
	3....	29.39	84	83	N.	0.17	Clouds; sunshine.
	10....	29.43	80	71	N.	.....	Clear.
	Sunrise	29.34	80	60	NW.	.....	Do
15	9....	29.53	81	76	NW.	.....	Do
	12....	29.52	82	82	NW.	.....	few clouds.
	3....	29.52	82	84	NNW.	.....	Do
	10....	29.54	78	70	NNW.	.....	Do
16	Sunrise	29.61	75	58	N.	.....	Do
	8....	29.59	78	69	NNE.	.....	Do
	12....	29.55	80	79	NE.	.....	Do
	3....	29.56	76	83	NE.	.....	Do
17	Sunrise	29.61	80	60	ENE.	.....	Do
	9....	29.58	83	80	ENE.	.....	Do
	12....	29.53	84	85	ENE.	.....	Do
	3....	29.53	81	86	ENE.	.....	light clouds.
17	10....	29.53	81	73	.....	.....	Do
	Sunrise	29.51	78	66	SW.	.....	Do
	9....	29.49	82	79	SW.	.....	Do
18	12....	29.49	82	88	SE.	.....	Do
	3....	29.43	84	91	SE.	.....	Nearly clear.
	10....	29.43	84	76.3	SE.	.....	Do
	Sunrise	29.43	83	71	SSW.	.....	Do

16	Sunrise	11....	29.56	76	70	Do
		9....	29.61	80	60	Do
		12....	29.58	83	80	Do
		3....	29.53	84	85	Do
		10....	29.53	81	73	Do
17	Sunrise	9....	29.51	78	66	Do
		12....	29.49	83	79	Do
					88	Do
						Do

light clouds.

18	Sunrise	3....	29.43	84	91	Do
		10....	29.43	84	76.3	Nearly clear.
		9....	29.43	83	85	Do
		12....	29.41	86	71	Do
		3....	29.40	89	89	Do
19	Sunrise	10....	29.39	86	92	Do
		9....	29.44	84	78	Do
		12....	29.44	88	70	Clear.
		3....	29.41	90	87	Do
		8....			91	Nearly clear.
20	Sunrise	10....	29.44	87	95.5	Thunder and rain.
		9....	29.53	82	81	Overclouded.
		12....	29.56	85	74	Clear.
		3....	29.55	86	84	Do
		10....	29.54	88	89	Do
21	Sunrise	10....	29.54	83	89.5	Do
		9....	29.55	80	75	Do
		12....	29.54	82	62	Do
		3....	29.49	85	81	Hazy; sun faint.
		11....	29.49	82	87	Nearly clear; light clouds.
22	Sunrise	9....	29.46	84	77	Do
		12....	29.46	87	89	Clear; few clouds.
		3....	29.43	90	85	Do
		10....	29.44	85	91	Do
		9....	29.49	82	85	Do
23	Sunrise	9....	29.49	82	71	Do
		12....	29.48	84	85	Do
		3....	29.43	90	85	Do
		10....	29.44	85	94	Nearly clear.
		9....	29.49	82	77	Clouds.
24	Sunrise	9....	29.49	82	73	Hazy; sunshine.
		12....	29.48	83	94	Overclouded.
		3....	29.44	87	88	Cloudy.
		10....	29.49	85	90	Clouds; hot sunshine; thunder storm S. at 6.
		9....	29.59	83	79	Cloudy.
25	Sunrise	9....	29.56	86	73	Cloudy.
		12....	29.56	86	86	Nearly clear.
		3....	29.54	88	93	Cloudy; sunshine.
		11....	29.57	85	94	Clouds; sunshine.
		9....	29.56	83	71	Nearly clear.

Do little hazy.
Do
Somewhat cloudy

METEOROLOGICAL OBSERVATIONS AT ST. LOUIS—Continued.

Date.	Hour.	Barometer.	Thermometer.		Wind.	Rain.	Memoranda.
			Attached.	Free.			
1842. July	25	29.52	Degrees. 89	Degrees. 92	NE.	.....	Somewhat cloudy; hazy; sun hot.
	10.....	29.50	86	83	SE.	0.12	Hazy; moon faint.
	Sunrise	29.53	88	77	SE.	.....	Hazy; nearly clear.
	9.....	29.47	85	82	SW.	.....	Clouds. Thunderstorm at 11 o'clock.
26	1.....	29.41	85	84	NW.	.....	Do
	4.....	29.45	83	76	NW.	.....	Do
	10.....	.....	74	74	SE.	.....	Nearly clear.
	Sunrise	29.46	83	85	SSE.	.....	Nearly clear; few clouds.
27	9.....	29.44	87	87	SE.	0.01	Sunshine; thunder clouds all round; soon afterward, storm and rain from E.
	12.....	.....	.....	.....	.....	.....	.....
	2.....	29.40	.....	91	.....	.....	Overclouded; windy.
	3.....	.....	88	87	E.	.....	Cloudy; stars faint.
28	11.....	29.42	83	77	E.	.....	Overclouded.
	Sunrise	.....	.....	75	SE.	.....	Do
	9.....	29.42	82	82	SE.	.....	Cloudy; sunshine.
	12.....	29.39	85	87	SE.	0.08	Thunder and rain between 1 and 2 o'clock.
29	3.....	29.37	84	87	SE.	0.06	Heavy but short thunder storm and rain.
	6.....	.....	.....	.....	E.	.....	Cloudy.
	10.....	29.38	83	77	E.	.....	Do
	Sunrise	.....	.....	75	SE.	.....	Nearly clear; light clouds.
30	9.....	29.37	83	85	SE.	.....	Heavy thunder clouds SW.; thunder storm and rain at 1 o'clock.
	12.....	29.34	87	90	S.	.....	Overclouded.
	3.....	29.27	83	82	E.	0.05	Heavy thunder storm; rain fifteen minutes.
	5.....	.....	.....	76	SSE.	0.16	Cloudy; rain at night.
30	9.....	29.25	81	76	S.	.....	Cloudy.
	Sunrise	29.16	85	78	S.	.....	Some clouds; sultry.
	9.....	.....	.....	86	S.	.....	.....
	.....	.....	.....	86	.....	.....	.....

12.....	29.11	85	86	SW.	Overclouded. Rain at 2 o'clock.
3.....	29.13	85	86	NW.	Overclouded.
6.....	.....	76	87	N.	Very dark; heavy rain for a few minutes.
10.....	29.25	76	87	NNE	Windy; sun out.

29	Sunrise	3	29.37	75	SE.	Do
		9	29.37	83	SE.	Nearly clear; light clouds.
		12	29.34	87	SE.	Heavy thunder clouds SW.; thunder storm and rain at 1 o'clock.
		3	29.27	82	E.	Overclouded.
		5			SE.	0.05
		9	29.25	81		Heavy thunder storm; rain fifteen minutes.
		12	29.25	76		Cloudy; rain at night.
30	Sunrise	9	29.16	85	S.	Cloudy.
					S.	Some clouds; sultry.

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METEOROLOGICAL OBSERVATIONS AT ST. LOUIS—Continued.

Date.	Hour.	Barometer.	Thermometer.		Wind.	Rain.	Memoranda.
			Attached.	Free.			
August 7	12....	29.37	Degrees. 79	Degrees. 81.5	W.	Inches.	Overclouded.
	3....	29.36	81	84	.....	.....	Nearly clear.
	101....	29.37	80	73	.....	.....	Do
8	Sunrise	.....	.....	59	NW.	.....	Overcast.
	9....	29.39	71	65	NE.	.....	Do
	12....	29.40	73	71	NNE.	.....	Do
9	3....	29.38	75	75	NNW.	.....	Clearing up.
	10....	29.37	74	67	NNW.	.....	Clear.
	Sunrise	.....	.....	61	NNE.	.....	Hazy; cloudy.
10	9....	29.43	75	73	NNE.	.....	Clearing up.
	12....	29.41	77	82	E.	.....	Nearly clear; clouds.
	3....	29.40	80	84	ESE.	.....	Do do
11	10....	29.41	78	71	.....	.....	Clear.
	Sunrise	.....	.....	68	ESE.	.....	Overclouded.
	9....	29.46	75	75	E.	.....	Do
12	12....	29.46	75	77	SE.	.....	Sprinkling of rain.
	3....	29.45	75	75	S.	0.35	Raining.
	11....	29.44	74	68	.....	.....	Do
13	Sunrise	29.43	71	61	NE.	0.19	Some rain; overcast.
	9....	29.44	72	66	E.	0.32	Raining.
	12....	29.44	72	63	E.	0.32	Raining hard.
14	3....	29.40	73	70	E.	0.14	Overcast.
	10....	29.40	73	69	.....	.....	Overclouded.
	Sunrise	29.37	70	67	ENE.	0.39	Overcast; some rain.
15	9....	29.39	72	70.5	ENE.	.....	Do do
	12....	29.38	73	77	ENE.	0.05	Do do
	3....	29.34	75	79	ENE.	.....	Overclouded.
16	12....	29.31	74	71	NE.	.....	Do
	Sunrise	.....	.....	69	E.	0.11	Raining.
	9....	29.29	73	73	E.	.....	.....

Some rain.
Raining.
Rain at night.

E.
E.
SE.

75.5
73
70

76
75
73

29.38
29.36
29.33

12....
3....
11....

